

	L #	Hits	Search Text	DBs	Time Stamp
1	L1	1081	ALD ALCVD (atomic adj layer adj deposit\$3) (sequential adj layer adj deposit\$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 16:34
2	L8	129	(TMA DMAH DMEAA TIBA TEA thd) near12 (react\$3 bond\$3 chemisor\$5) near12 (insulat\$3 dielectric ferroelectric oxide dioxide hydroxyl OH ?OH)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 16:38
3	L15	24312	(trimethylaluminum dimethylaluminum alane aluminum al chloride) near12 (react\$3 bond\$3 chemisor\$5) near12 (insulat\$3 dielectric ferroelectric oxide dioxide hydroxyl OH ?OH)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 16:40
4	L22	24403	8 15	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 16:40
5	L29	32	1 and 22	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 16:41

	L #	Hits	Search Text	DBs	Time Stamp
1	L88	53669	(barrier prevent\$3 reduc\$3 stop\$4) near4 (diffus\$4 difus\$4)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 13:45
2	L95	66	88 near15 (dielectric ferroelectric perovskite BST tantalate titanate PZT) near15 (hydrogen or "H.sub.2")	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 13:48
3	L102	47	95 and capacitor	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 14:17
4	L116	4935	(react\$3 bond\$3) near15 (insulat\$3 dielectric IMD PMD ILD) near15 (oxidiz\$3 oxidis\$3 oxide oxidation)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 15:45
5	L123	5609	(sequential layer atomic) adj2 layer adj2 (deposit\$3 epitax\$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 16:08
6	L130	2392	ALD ALCVD (puls\$3 adj3 (CVD deposit\$3))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 16:08
7	L137	7832	123 130	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 15:48
8	L144	153	116 and 137	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 16:10
9	L151	900	(sequential atomic) adj2 layer adj2 (deposit\$3 epitax\$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 16:09
10	L158	2107	ALD ALCVD (puls\$3 adj2 (CVD deposit\$3))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 16:09
11	L165	2868	151 158	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 16:09
12	L172	43	116 and 165	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/03/20 16:10

Your SELECT statement is

*s (ALD or ALCVD or ALE or (sequential or atomic) (2w) layer (2W) (deposit?
or epitax?)) and react? (5N) (oxide or dielectric or oxygen or hydroxide or
hydroxyl)

Items	File
8	2: INSPEC_1969-2002/Mar W3
7	5: Biosis Previews(R)_1969-2002/Mar W3
2	6: NTIS_1964-2002/Mar W5
18	8: Ei Compendex(R)_1970-2002/Mar W3
11	31: World Surface Coatings Abs_1976-2002/Mar
50	34: SciSearch(R) Cited Ref Sci_1990-2002/Mar W3
9	35: Dissertation Abs Online_1861-2002/Mar
8	73: EMBASE_1974-2002/Mar W2
2	94: JICST-EPlus_1985-2002/Feb W1
3	95: TEME-Technology & Management_1989-2002Jan W3
1	96: FLUIDEX_1972-2002/Feb

Processing

4	103: Energy SciTec_1974-2001/Sep B2
2	108: AEROSPACE DATABASE_1962-2002/JAN
13	144: Pascal_1973-2002/Mar W3
9	155: MEDLINE(R)_1966-2002/Mar W2
1	187: F-D-C Reports_1987-2002/Feb W4
1	238: Abs. in New Tech & Eng._1981-2002/Mar
1	248: PIRA_1975-2002Mar W4
10	315: ChemEng & Biotec Abs_1970-2002/Dec
3	332: Material Safety Data Sheets -2002/Q1

Examined 50 files

1	335: Ceramic Abstracts_1976-2001/Q4
118	340: CLAIMS(R)/US Patent_1950-02/Mar 14
4	347: JAPIO_Oct/1976-2001/Nov(Updated 020305)

Processing

872	348: EUROPEAN PATENTS_1978-2002/Mar W02
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>>>File 349 processing for REACT? stopped at REACTORG

1245	349: PCT FULLTEXT_1983-2002/UB=20020314,UT=20020307
70	353: Ei EnCompassPat(TM)_1964-2002/Dec W1

Status: Break Sent.

?b 2,8,31,35,94,144,335

20mar02 17:11:38 User264704 Session D107.2

\$11.96 6.833 DialUnits File411

\$11.96 Estimated cost File411

\$0.40 TYMNET

\$12.36 Estimated cost this search

\$12.37 Estimated total session cost 7.060 DialUnits

SYSTEM:OS - DIALOG OneSearch

File	2:INSPEC_1969-2002/Mar W3
	(c) 2002 Institution of Electrical Engineers
File	8:Ei Compendex(R)_1970-2002/Mar W3
	(c) 2002 Engineering Info. Inc.
File	31:World Surface Coatings Abs_1976-2002/Mar
	(c) 2002 Paint Research Assn.
File	35:Dissertation Abs Online_1861-2002/Mar
	(c) 2002 ProQuest Info&Learning
File	94:JICST-EPlus_1985-2002/Feb W1
	(c)2002 Japan Science and Tech Corp(JST)

*File 94: There is no data missing. UD's have been adjusted to reflect
the current months data. See Help News94 for details.

File	144:Pascal_1973-2002/Mar W3
	(c) 2002 INIST/CNRS

File	335:Ceramic Abstracts_1976-2001/Q4
	(c) 2001 Cambridge Scientific Abs.

Set Items Description

* ?s (ALD or ALCVD or ALE or (sequential or atomic) (2w) layer (2W) (deposit? or epitax?)) and react? (5N) (oxide or dielectric or oxygen or hydroxide or hydroxyl)

Processing

1423 ALD
53 ALCVD
4175 ALE
122954 SEQUENTIAL
590532 ATOMIC
885416 LAYER
698125 DEPOSIT?
223845 EPITAX?
4556 (SEQUENTIAL OR ATOMIC) (2W) LAYER (2W) (DEPOSIT? OR EPITAX?)
2461665 REACT?
664792 OXIDE
317318 DIELECTRIC
891163 OXYGEN
50978 HYDROXIDE
48634 HYDROXYL
90260 REACT? (5N) (((OXIDE OR DIELECTRIC) OR OXYGEN) OR
HYDROXIDE) OR HYDROXYL
S1 62 (ALD OR ALCVD OR ALE OR (SEQUENTIAL OR
ATOMIC) (2W) LAYER (2W) (DEPOSIT? OR EPITAX?)) AND
REACT? (5N) (OXIDE OR DIELECTRIC OR OXYGEN OR HYDROXIDE OR
HYDROXYL)

?rd

...examined 50 records (50)

...completed examining records

S2 53 RD (unique items)

?t s2/full/all

2/9/1 (Item 1 from file: 2)

DIALOG(R) File 2:INSPEC

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7008212 INSPEC Abstract Number: A2001-18-7755-014

Title: Increment of the dielectric constant of Ta/sub 2/O/sub 5/ thin films by retarding interface oxide growth on Si substrates

Author(s): Hyun-Jung Song; Choon-Soo Lee; Sang-Won Kang

Author Affiliation: Dept. of Mater. Sci. & Eng., Korea Inst. of Technol., Taejeon, South Korea

Journal: Electrochemical and Solid-State Letters vol.4, no.7 p. F13-14

Publisher: Electrochem. Soc,

Publication Date: July 2001 Country of Publication: USA

CODEN: ESLEF6 ISSN: 1099-0062

SICI: 1099-0062(200107)4:7L.f13:IDCT;1-O

Material Identity Number: G381-2001-006

U.S. Copyright Clearance Center Code: 1099-0062/2001/4(7)/13/2/\$7.00

Document Number: S1099-0062(01)01207-X

Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P); Experimental (X)

Abstract: The improved electrical properties of tantalum oxides grown by plasma-enhanced atomic layer deposition (PEALD) are presented. In PEALD, oxygen radicals were served as a reactant of Ta(OC/sub 2/H/sub 5/)/sub 5/ at a deposition temperature of 260 degrees C. The interface oxide layer, which was formed during the initial stage of the PEALD, retards its further growth during the annealing process at 700 degrees C for 2 min in O/sub 2/ ambient, and is thought to be not pure SiO/sub 2/ but Ta/sub x/Si/sub y/O. The stoichiometry of the as-deposited film is oxygen-rich, having no hydrocarbon impurity. As a result, on the films with a thickness of T/sub SiO2.eq/=1.7 nm, the leakage current density, dominated by Schottky emission, reduces to 3.38*10/sup -7/ A/cm/sup 2/ at 1 MV/cm, and the dielectric constant is obtained as high as epsilon /sub r/=38 even after the annealing process. (10 Refs)

Subfile: A

Descriptors: **atomic layer epitaxial** growth; dielectric thin films; permittivity; plasma deposited coatings; tantalum compounds

Identifiers: dielectric constant; Ta/sub 2/O/sub 5/ thin films; retarding interface oxide growth; Si substrates; electrical properties; plasma-enhanced **atomic layer deposition**; stoichiometry; leakage current density; Schottky emission; 2 min; 1.7 nm; 260 C; Ta/sub 2/O/sub 5/; Si

Class Codes: A7755 (Dielectric thin films); A7720 (Dielectric permittivity); A5275R (Plasma applications in manufacturing and materials processing); A6855 (Thin film growth, structure, and epitaxy); A8115G (Vacuum deposition); A6822 (Surface diffusion, segregation and interfacial compound formation)

Chemical Indexing:

Ta2O5 bin - Ta2 bin - O5 bin - Ta bin - O bin (Elements - 2)

Si sur - Si el (Elements - 1)

Numerical Indexing: time 1.2E+02 s; size 1.7E-09 m; temperature 5.33E+02

K

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2/9/2 (Item 2 from file: 2)

DIALOG(R)File 2:INSPEC

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6712714 INSPEC Abstract Number: A2000-21-6855-034

Title: **Titanium isopropoxide as a precursor for atomic layer deposition : characterization of titanium dioxide growth process**

Author(s): Aarik, J.; Aidla, A.; Uustare, T.; Ritala, M.; Leskela, M.

Author Affiliation: Inst. of Mater. Sci., Tartu Univ., Estonia

Journal: Applied Surface Science vol.161, no.3-4 p.385-95

Publisher: Elsevier,

Publication Date: July 2000 Country of Publication: Netherlands

CODEN: ASUSEE ISSN: 0169-4332

SICI: 0169-4332(200007)161:3/4L:385:TIPA;1-F

Material Identity Number: I974-2000-013

U.S. Copyright Clearance Center Code: 0169-4332/2000/\$20.00

Document Number: S0169-4332(00)00274-9

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: **Atomic layer deposition (ALD)** of titanium oxide from titanium isopropoxide (Ti(OCH(CH/sub 3/)/sub 2/)/sub 4/) and water as well as from Ti(OCH(CH/sub 3/)/sub 2/)/sub 4/ and hydrogen peroxide (H/sub 2/O/sub 2/) was studied. According to data of real-time quartz crystal microbalance (QCM) measurements, adsorption of Ti(OCH(CH/sub 3/)/sub 2/)/sub 4/ was a self-limited process at substrate temperatures 100-250 degrees C. At 200-250 degrees C, the growth rate was independent of whether water or H/sub 2/O/sub 2/ was used as the **oxygen** precursor. Insufficient **reactivity** of water vapor hindered the film growth at temperatures 100-150 degrees C. Incomplete removal of the precursor ligands from solid surface by water pulse was revealed as the main reason for limited deposition rate. The growth rate increased significantly and reached 0.12 nm per cycle at 100 degrees C when water was replaced with H/sub 2/O/sub 2/. The carbon contamination did not exceed 1 at.% and the refractive index was 2.3 in the films grown at temperatures as low as 100 degrees C. (21 Refs)

Subfile: A

Descriptors: adsorption; **atomic layer epitaxial** growth; organic compounds; refractive index; titanium compounds

Identifiers: titanium isopropoxide; precursor; **atomic layer deposition**; characterization; TiO/sub 2/ growth process; real-time quartz crystal microbalance measurements; adsorption; self-limited process; substrate temperatures; growth rate; oxygen precursor; reactivity; water vapor; film growth; water pulse; limited deposition rate; carbon contamination; refractive index; 100 to 250 degC; H/sub 2/O/sub 2/; H/sub 2/O; TiO/sub 2/

Class Codes: A6855 (Thin film growth, structure, and epitaxy); A6845D (Adsorption and desorption kinetics; evaporation and condensation); A7820D (

Optical constants and parameters (condensed matter)); A8115G (Vacuum deposition); A8115H (Chemical vapour deposition); A7865P (Optical properties of other inorganic semiconductors and insulators (thin films/low-dimensional structures))

Chemical Indexing:

H2O2 bin - H2 bin - O2 bin - H bin - O bin (Elements - 2)

H2O bin - H2 bin - H bin - O bin (Elements - 2)

TiO2 bin - O2 bin - Ti bin - O bin (Elements - 2)

Numerical Indexing: temperature 3.73E+02 to 5.23E+02 K

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2/9/3 (Item 3 from file: 2)

DIALOG(R)File 2:INSPEC

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6471811 INSPEC Abstract Number: A2000-04-6855-052, B2000-02-0520B-025

Title: Tantalum oxide films prepared by unbalanced reactive magnetron sputtering

Author(s): Rama Rao, N.; Chandramani, R.; Mohan Rao, G.

Author Affiliation: Dept. of Phys., Bangalore Univ., India

Journal: Journal of Materials Science Letters vol.18, no.23 p. 1949-51

Publisher: Kluwer Academic Publishers,

Publication Date: 1 Dec. 1999 Country of Publication: USA

CODEN: JMSLD5 ISSN: 0261-8028

SICI: 0261-8028(19991201)18:23L:1949:TOFP;1-E

Material Identity Number: H146-2000-001

U.S. Copyright Clearance Center Code: 0261-8028/99/\$9.50

Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P); Experimental (X)

Abstract: Tantalum oxide is currently gaining importance due to its interesting properties. It has a reasonably high dielectric constant (25-40) and a refractive index of about 2.2. Thus it can be used as a gate insulator in thin film memory devices and also an anti-reflecting layer on silicon solar cells to improve the performance. In the last couple of years Ta/sub 2O/sub 5/ films have been studied extensively. Several techniques like **atomic layer deposition**, spin coating and reactive sputtering and ion beam sputtering have been used to prepare these films. It has been widely accepted that ion bombardment during the deposition of thin films would greatly enhance the characteristics of the coatings in terms of their crystallinity, packing density etc. In the evaporation process, this is accomplished by using a Kauffman ion gun, which focuses a collimated ion beam on the substrate. However, in sputter deposition due to the geometrical limitations such ion guns are not practical. In the case of unbalanced magnetron sputtering, the distribution of the magnetic field on the substrate causes ionization and hence bombardment on the growing film. The use of unbalanced magnetron sputtering for **reactive** sputtering of **oxide** coatings for optical applications is not widely reported. In this study we have prepared films of tantalum oxide by unbalanced magnetron sputtering in an oxygen and argon mixture and investigated their structural and optical properties. The initial results have shown some interesting features and in this letter we present the preliminary data. (13 Refs)

Subfile: A B

Descriptors: insulating thin films; sputtered coatings; tantalum compounds

Identifiers: unbalanced reactive magnetron sputtering; refractive index; high dielectric constant; structural properties; optical properties; TaO/sub x/; TaO

Class Codes: A6855 (Thin film growth, structure, and epitaxy); A8115C (Deposition by sputtering); A7865P (Optical properties of other inorganic semiconductors and insulators (thin films/low-dimensional structures)); B0520B (Sputter deposition)

Chemical Indexing:

TaO bin - Ta bin - O bin (Elements - 2)

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2/9/4 (Item 4 from file: 2)

DIALOG(R)File 2:INSPEC

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6242320 INSPEC Abstract Number: A1999-12-8115G-007, B1999-06-0520D-039

Title: Selective area growth by metal organic vapor phase epitaxy and atomic layer epitaxy using Ga/sub 2/O/sub 3/ as a novel mask layer

Author(s): Hirose, S.; Yoshida, A.; Yamaura, M.; Hara, K.; Munekata, H.

Author Affiliation: Mech. Eng. Lab., AIST, MITI, Ibaraki, Japan

Journal: Japanese Journal of Applied Physics, Part 1 (Regular Papers, Short Notes & Review Papers) vol.38, no.3A p.1516-20

Publisher: Publication Office, Japanese Journal Appl. Phys.

Publication Date: March 1999 Country of Publication: Japan

CODEN: JAPNDE ISSN: 0021-4922

SICI: 0021-4922(199903)38:3AL:1516:SAGM;1-A

Material Identity Number: F221-1999-007

Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P); Experimental (X)

Abstract: A novel technique is proposed for advanced microstructure formation using Ga/sub 2/O/sub 3/ as a new mask material. Ga/sub 2/O/sub 3/ layers were prepared by RF sputtering with Ga/sub 2/O₃ powder target and patterned using photolithography. Scanning electron microscope (SEM) and photoluminescence (PL) measurement findings indicate that reasonably high-quality single crystalline GaAs layers could be successfully grown selectively on the unmasked region by metal organic vapor phase epitaxy (MOVPE) and **atomic layer epitaxy (ALE)**. The GaAs/AlGaAs quantum structure was also fabricated by selective area MOVPE, however, at this stage, polycrystalline AlGaAs layers formed on the mask region after the mask removal and the regrowth of AlGaAs overlayers. The key factor in this microstructure fabrication process is the sensitive dependence of Ga oxide layers against the **reactor** pressure under H/sub 2/ exposure. (16 Refs)

Subfile: A B

Descriptors: aluminium compounds; **atomic layer epitaxial** growth; gallium arsenide; III-V semiconductors; MOCVD coatings; photolithography; photoluminescence; scanning electron microscopy; semiconductor epitaxial layers; semiconductor growth; vapour phase epitaxial growth

Identifiers: selective area growth; metal organic vapor phase epitaxy; **atomic layer epitaxy**; Ga/sub 2/O/sub 3/; mask layer; advanced microstructure formation; RF sputtering; photolithography; SEM; photoluminescence; MOVPE; **ALE**; GaAs/AlGaAs quantum structure; GaAs-AlGaAs

Class Codes: A8115G (Vacuum deposition); A8115H (Chemical vapour deposition); A6855 (Thin film growth, structure, and epitaxy); A7865K (Optical properties of III-V and II-VI semiconductors (thin films/low-dimensional structures)); A7855E (Photoluminescence in II-VI and III-V semiconductors); B0520D (Vacuum deposition); B2520D (II-VI and III-V semiconductors); B0520F (Chemical vapour deposition); B2550G (Lithography (semiconductor technology))

Chemical Indexing:

GaAs-AlGaAs int - AlGaAs int - GaAs int - Al int - As int - Ga int - AlGaAs ss - Al ss - As ss - Ga ss - GaAs bin - As bin - Ga bin (Elements - 2,3,3)

Ga₂O₃ sur - Ga₂ sur - Ga sur - O₃ sur - O sur - Ga₂O₃ bin - Ga₂ bin - Ga bin - O₃ bin - O bin (Elements - 2)

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2/9/5 (Item 5 from file: 2)

DIALOG(R)File 2:INSPEC

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6052096 INSPEC Abstract Number: A9822-8115G-019

Title: Deposition of lanthanum sulfide thin films by atomic layer epitaxy

Author(s): Kukli, K.; Heikkinen, H.; Nykaenen, E.; Niinistoe, L.

Author Affiliation: Lab. of Inorg. & Anal. Chem., Helsinki Univ. of Technol., Espoo, Finland

HeO2 bin - He bin - O2 bin - O bin (Elements - 2)
AlCl3 bin - Cl3 bin - Al bin - Cl bin (Elements - 2)
AlCl2 ads - Cl2 ads - Al ads - Cl ads - AlCl2 bin - Cl2 bin - Al bin - Cl
bin (Elements - 2)

2/9/9 (Item 1 from file: 8)
DIALOG(R) File 8: Ei Compendex(R)
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06010453 E.I. No: EIP02086867844

Title: XPS instrument coupled with ALCVD reactor for investigation of
film growth

Author: Sterner, J.; Kessler, J.; Stolt, L.

Corporate Source: Angstrom Solar Center Uppsala University, SE-751 21
Uppsala, Sweden

Source: Journal of Vacuum Science and Technology, Part A: Vacuum,
Surfaces and Films v 20 n 1 January/February 2002. p 278-284

Publication Year: 2002

CODEN: JVTAD6 **ISSN:** 0734-2101

Language: English

Document Type: JA; (Journal Article) **Treatment:** X; (Experimental)

Journal Announcement: 0203W1

Abstract: A technique was demonstrated where in situ XPS was used to give
detailed chemical information of the reactions involved in ALCVD growth
on the submonolayer level. This was achieved by interconnecting an XPS
system with an ALCVD reactor. An analysis conducted of the system showed
that it is possible to resolve chemical shifts due to the formation of
individual submonolayers. (Edited abstract) 15 Refs.

Descriptors: Film growth; X ray photoelectron spectroscopy; Chemical
vapor deposition; Chemical reactors; Crystal atomic structure; Zinc
oxide; Copper alloys; Solar cells; Phase transitions; Chemical reactions;
Surface phenomena; Ultraviolet spectroscopy

Identifiers: Atomic layer chemical vapor deposition; Chemical
changes; Ultraviolet photoelectron spectroscopy; Band alignment

Classification Codes:

933.1.2 (Crystal Growth); 933.1.1 (Crystal Lattice)

933.1 (Crystalline Solids); 931.3 (Atomic & Molecular Physics); 802.2
(Chemical Reactions); 802.1 (Chemical Plants & Equipment); 804.2
(Inorganic Compounds)

933 (Solid State Physics); 931 (Applied Physics Generally); 802
(Chemical Apparatus & Plants; Unit Operations; Unit Processes); 804
(Chemical Products Generally)

93 (ENGINEERING PHYSICS); 80 (CHEMICAL ENGINEERING, GENERAL)

2/9/10 (Item 2 from file: 8)
DIALOG(R) File 8: Ei Compendex(R)
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06003591 E.I. No: EIP02066853667

Title: Reaction mechanism studies on titanium isopropoxide-water atomic
layer deposition process

Author: Rahtu, Antti; Ritala, Mikko

Corporate Source: Laboratory of Inorganic Chemistry Department of
Chemistry University of Helsinki, FIN-00014 Helsinki, Finland

Source: Advanced Materials v 14 n 2 Jan 16 2002. p 21-28

Publication Year: 2002


CODEN: ADVMEW **ISSN:** 0935-9648

Language: English

Document Type: JA; (Journal Article) **Treatment:** X; (Experimental)

Journal Announcement: 0202W2

Abstract: Reaction mechanisms between titanium isopropoxide and
deuterated water in the atomic layer deposition (ALD) of TiO₂ at
150-350 degree C were studied using a quartz crystal microbalance (QCM)
and a quadrupole mass spectrometer (QMS). The temperature had no marked
effect on the total amount of the main gaseous by-product (CH₃/3//2CHOD.

At 150-250 degree C, about half of the ligands were released in reactions with surface **hydroxyl** groups during the $Ti(OCH(CH_3)_2)_4$ pulse, and the other half during the water pulse. At higher temperatures, $Ti(OCH(CH_3)_2)_4$ began to thermally decompose, thus affecting the growth mechanism. The results were compared with earlier CVD and **ALD** studies. 55 Refs. 

Descriptors: *Reaction kinetics; Titanium dioxide; Chemical vapor deposition; Quartz; Single crystals; Thin films; Refractive index; Film growth; Auger electron spectroscopy

Identifiers: **Atomic layer deposition (ALD)**

Classification Codes:

802.2 (Chemical Reactions); 804.2 (Inorganic Compounds); 482.2 (Minerals); 933.1 (Crystalline Solids); 714.2 (Semiconductor Devices & Integrated Circuits); 741.1 (Light & Optics)
802 (Chemical Apparatus & Plants; Unit Operations; Unit Processes); 804 (Chemical Products Generally); 482 (Mineralogy); 933 (Solid State Physics); 714 (Electronic Components & Tubes); 741 (Light, Optics & Optical Devices); 801 (Chemistry)
80 (CHEMICAL ENGINEERING, GENERAL); 48 (ENGINEERING GEOLOGY); 93 (ENGINEERING PHYSICS); 71 (ELECTRONICS & COMMUNICATION ENGINEERING); 74 (LIGHT & OPTICAL TECHNOLOGY)

2/9/11 (Item 3 from file: 8)
DIALOG(R) File 8: Ei Compendex(R)
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06001083 E.I. No: EIP02056848802

Title: Thin film atomic layer deposition equipment for semiconductor processing

Author: Sneh, Ofer; Clark-Phelps, Robert B.; Londergan, Ana R.; Winkler, Jereld; Seidel, Thomas E.

Corporate Source: Genus Inc., Sunnyvale, CA, United States

Source: Thin Solid Films v 402 n 1-2 Jan 1 2002. p 248-261

Publication Year: 2002

CODEN: THSFAP ISSN: 0040-6090

Language: English

Document Type: JA; (Journal Article) Treatment: T; (Theoretical)

Journal Announcement: 0202W2

Abstract: Atomic layer deposition (ALD) of ultrathin high-K dielectric films has recently penetrated research and development lines of several major memory and logic manufacturers due to the promise of unprecedented control of thickness, uniformity, quality and material properties. LYNX- **ALD** technology from Genus, currently at beta phase, was designed around the anticipation that future ultrathin materials are likely to be binary, ternary or quaternary alloys or nanolaminate composites. A unique chemical delivery system enables synergy between traditional, production-proven low pressure chemical vapor deposition (LPCVD) technology and **atomic layer deposition (ALD)** controlled by sequential surface reactions. Source chemicals from gas, liquid or solid precursors are delivered to impinge on reactive surfaces where self-limiting surface reactions yield film growth with layer-by-layer control. Surfaces are made reactive by the self-limiting reactions, by surface species manipulation, or both. The substrate is exposed to one reactant at a time to suppress possible chemical vapor deposition (CVD) contribution to the film. Precisely controlled composite materials with multiple-component dielectric and metal-nitride films can be deposited by **ALD** techniques. The research community has demonstrated these capabilities during the past decade. Accordingly, **ALD** equipment for semiconductor processing is unanimously in high demand. However, mainstream device manufacturers still criticize **ALD** to be non-viable for Semiconductor device processing. This article presents a broad set of data proving feasibility of **ALD** technology for semiconductor device processing. copy 2002 Elsevier Science B.V. All rights reserved. 44 Refs.

Descriptors: Ultrathin films; Deposition; Semiconductor device manufacture; Laminated composites; Surface reactions; Dielectric films

Identifiers: **Atomic layer deposition (ALD)**; Semiconductor

processing

Classification Codes:

714.2 (Semiconductor Devices & Integrated Circuits); 802.3 (Chemical Operations); 802.2 (Chemical Reactions); 708.1 (Dielectric Materials)
714 (Electronic Components & Tubes); 802 (Chemical Apparatus & Plants; Unit Operations; Unit Processes); 708 (Electric & Magnetic Materials)
71 (ELECTRONICS & COMMUNICATION ENGINEERING); 80 (CHEMICAL ENGINEERING, GENERAL); 70 (ELECTRICAL ENGINEERING, GENERAL)

2/9/12 (Item 4 from file: 8)

DIALOG(R)File 8: Ei Compendex(R)

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05997617 E.I. No: EIP02056843682

Title: Epitaxial growth of TiO//2 films in a hydroxyl-free atomic layer deposition process

Author: Schuisky, Mikael; Kukli, Kaupo; Aarik, Jaan; Lu, Jun; Harsta, Anders

Corporate Source: Angstrom Laboratory Department of Materials Chemistry Uppsala University, 751 21 Uppsala, Sweden

Source: Journal of Crystal Growth v 235 n 1-4 February 2002. p 293-299

Publication Year: 2002

CODEN: JCRGAE ISSN: 0022-0248

Language: English

Document Type: JA; (Journal Article) Treatment: X; (Experimental)

Journal Announcement: 0202W1

Abstract: This study demonstrates that TiI//4-O//2 is a well working precursor system for epitaxial growth of titanium oxide films in an **atomic layer deposition** process that is not based on **reactions** with surface **hydroxyl** groups. Rutile and anatase were found to grow epitaxially on alpha-Al//2O//3(0 1 2) and MgO(0 0 1), respectively. The epitaxial relationships were determined by phi-scan and were found to be left bracket 0 1 0 right bracket //r//u//t//i//l//e parallel left bracket 1 0 0 right bracket //alpha//-//A//l//((//2//))//O//((//3//)); left bracket 1 0 1 over bar right bracket //r//u//t//i//l//e parallel left bracket 1 over bar 2 over bar 1 right bracket //alpha//-//A//l//((//2//))//O//((//3//)) for the rutile films grown on alpha-Al//2O//3(0 1 2) and left bracket 0 1 0 right bracket //a//n//a//t//a//s//e parallel left bracket 0 1 0 right bracket //M//g//O and left bracket 0 0 1 right bracket //a//n//a//t//a//s//e parallel left bracket 1 0 0 right bracket //M//g//O for the anatase films grown on MgO(0 0 1). These relationships were also confirmed by TEM. For the anatase films grown at higher temperatures, small amounts of rutile were present. The TEM investigation showed that the rutile phase was situated in the grain boundaries between the anatase grains. copy 2002 Elsevier Science B.V. All rights reserved. 24 Refs.

Descriptors: *Titanium dioxide; Epitaxial growth; Thin films; Chemical vapor deposition; Film growth; Grain boundaries; Dielectric materials; Transmission electron microscopy

Identifiers: **Atomic layer epitaxy**

Classification Codes:

933.1.2 (Crystal Growth)

804.2 (Inorganic Compounds); 802.3 (Chemical Operations); 933.1 (Crystalline Solids); 712.1 (Semiconducting Materials); 802.2 (Chemical Reactions); 708.1 (Dielectric Materials)

804 (Chemical Products Generally); 802 (Chemical Apparatus & Plants; Unit Operations; Unit Processes); 933 (Solid State Physics); 712 (Electronic & Thermionic Materials); 708 (Electric & Magnetic Materials)

80 (CHEMICAL ENGINEERING, GENERAL); 93 (ENGINEERING PHYSICS); 71 (ELECTRONICS & COMMUNICATION ENGINEERING); 70 (ELECTRICAL ENGINEERING, GENERAL)

2/9/13 (Item 5 from file: 8)

DIALOG(R)File 8: Ei Compendex(R)

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of Gases, Liquids & Solids); 921.6 (Numerical Methods)
741 (Optics & Optical Devices); 804 (Chemical Products); 802 (Chemical Apparatus & Plants); 931 (Applied Physics); 921 (Applied Mathematics)
74 (OPTICAL TECHNOLOGY); 80 (CHEMICAL ENGINEERING); 93 (ENGINEERING PHYSICS); 92 (ENGINEERING MATHEMATICS)

2/9/16 (Item 8 from file: 8)
DIALOG(R) File 8: Ei Compendex(R)
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04909072 E.I. No: EIP98014020488

Title: Functional surface groups for single-site heterogeneous alpha-olefin polymerization catalysts

Author: Iiskola, E.I.; Timonen, S.; Pakkanen, T.T.; Harkki, O.; Seppala, J.V.

Corporate Source: Neste Corp, Espoo, Finl

Conference Title: Proceedings of the 1996 6th Iketani International Symposium on Surface Nano-Control of Environmental Catalysts and Related Materials

Conference Location: Tokyo, Jpn Conference Date: 19961125-19961127

E.I. Conference No.: 47566

Source: Applied Surface Science v 121-122 Nov 2 1997. p 372-377

Publication Year: 1997

CODEN: ASUSEE ISSN: 0169-4332

Language: English

Document Type: JA; (Journal Article) Treatment: X; (Experimental)

Journal Announcement: 9803W2

Abstract: A novel heterogeneous alpha-olefin polymerization catalyst is prepared by the immobilization of $\text{CpZrCl}_2/3$ on a chemically modified silica support. The surface modification of silica was carried out by utilizing the saturated gas-solid reactions of a silane coupling agent with a hydrocarbon spacer, $\text{Cp}(\text{CH}_2)_2/3\text{Si}(\text{OCH}_2/2\text{CH}_2/3)/3$, and a partially dehydroxylated silica. In gas-solid reactions all reactive surface hydroxyl groups were utilized in bonding the silane coupling agent on silica. The immobilization of $\text{CpZrCl}_2/3$ on the cyclopentadienyl surface formed on the silica was done using liquid-phase reactions. The prepared materials were characterized by FT-IR spectroscopy. The supported catalyst system has a high activity in ethylene polymerization and can be used to produce polyethylene with a narrow molecular weight distribution in the presence of methylaluminoxane. The catalytic activity was doubled when $\text{CpZrCl}_2/3$ was immobilized on the cyclopentadienyl surface of SiO_2 compared with the activity of $\text{CpZrCl}_2/3$ in homogeneous catalysis. However, the direct heterogenization of $\text{CpZrCl}_2/3$ onto unmodified silica produced a catalyst with a very low activity. The effect of surface modification reactions and the surface structure of a support on the catalyst performance is presented and discussed. (Author abstract) 21 Refs.

Descriptors: *Catalysts; Catalyst supports; Polymerization; Polyethylenes; Epitaxial growth; Surface treatment; Surface structure; Silanes; Catalyst activity; Organometallics

Identifiers: Metallocene; Atomic layer epitaxy

Classification Codes:

815.1.1 (Organic Polymers); 933.1.2 (Crystal Growth)

815.2 (Polymerization); 815.1 (Polymeric Materials); 933.1 (Crystalline Solids)

804 (Chemical Products); 803 (Chemical Agents & Basic Industrial Chemicals); 815 (Plastics & Polymeric Materials); 933 (Solid State Physics); 802 (Chemical Apparatus & Plants)

80 (CHEMICAL ENGINEERING); 81 (CHEMICAL PROCESS INDUSTRIES); 93 (ENGINEERING PHYSICS)

2/9/17 (Item 9 from file: 8)
DIALOG(R) File 8: Ei Compendex(R)
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04895356 E.I. No: EIP97123967259

times of 8 and 10 days without pH control. (Author abstract 8 Refs.
Descriptors: *BREWERY--Effluent Treatment; WASTEWATER--Biological
Treatment; BIOREACTORS--Fermenters; FILMS--Biofilms
Identifiers: ANAEROBIC DIGESTION; FIXED-FILM REACTOR
Classification Codes:
822 (Food Technology); 452 (Sewage & Industrial Wastes Treatment); 802
(Chemical Apparatus & Plants)
82 (AGRICULTURE & FOOD TECHNOLOGY); 45 (POLLUTION & SANITARY
ENGINEERING); 80 (CHEMICAL ENGINEERING)

2/9/24 (Item 1 from file: 31)
DIALOG(R)File 31:World Surface Coatings Abs
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00546362 WSCA ABSTRACT NUMBER: 01-05277 WSCA ID NUMBER: 525277
Fluorine Chemistry for Organic Chemists: Problems and Solutions.
HUDLICKY M
Oxford University Press, Oxford 2000, 130 pp. (ISBN 0-19-513156-8). Price
#35.00.
2000
JOURNAL ANNOUNCEMENT: 0107 WSCA UPDATE CODE: 200107
DOCUMENT TYPE: Book LANGUAGE: English
SECTION (CODE,HEADING): 99 Books
SECTION CODE CROSS-REFERENCE: 05;

ABSTRACT: This book comprises two parts, problems and solutions. 105 of
the most exceptional or unpredictable reactions for fluorine compounds are
first presented as problems to be solved. Explanations, products and
reaction mechanisms are detailed in the solutions in the second half. The
book covers reactions from reduction to pyrolysis, with sections
emphasising reactions of fluoro compounds with halogens and their
derivatives, reactions with sulphur trioxide, hydrolyses, alkylations,
aldol-type condensations, organo-metallic syntheses, additions,
eliminations and molecular rearrangements. 142 refs.

DESCRIPTORS: Fluorine
CHEMICAL NAMES: fluorine; sulphur trioxide; aldol; organo-metallic
IDENTIFIERS: Fluorine-- chemistry, reactions, problems/solutions, books
ADDITIONAL TERMS (IDENTIFIERS): hydrolysis; oxidation

2/9/25 (Item 2 from file: 31)
DIALOG(R)File 31:World Surface Coatings Abs
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00537146 WSCA ABSTRACT NUMBER: 00-05668 WSCA ID NUMBER: 505668
**Blocked amine as curing agent for water-borne one-component epoxy resin
system.**
PATENT ASSIGNEE: VIANOVA RESINS AG;
PATENT INFORMATION: European Patent Application, 10 pp.
PATENT (NUMBER,DATE): EP 957121
JOURNAL ANNOUNCEMENT: 0008 WSCA UPDATE CODE: 200008
DOCUMENT TYPE: Patent LANGUAGE: German
SECTION (CODE,HEADING): 36 Water-borne Coatings and their Components
SECTION CODE CROSS-REFERENCE: 18;

ABSTRACT: The capped amine curing agents are useful in one-pack
water-borne epoxy compositions and have good compatibility. They are easily
prepared from di-primary amine with primary amine groups, reacted with
cyclic alkylene carbonate, preferably alpha,omega-alkylene carbonate, to
form hydroxyalkyl urethane. Free primary amino groups are then reacted with
aliphatic carbonyl compound to form ketimine or aldimine groups, and the
product is then reacted with compounds with hydroxyl-reactive groups.
Water-borne epoxy compsns. are also claimed. (In German)

DESCRIPTORS: Curing Agents; Epoxy Resins; Amines; Water-borne
Compositions; Amines

CHEMICAL NAMES: ketone; epoxy resin; amine; alkylene bonate;
carbonate; urethane; carbonyl; ketimine; **aldimine**; hydroxyl
IDENTIFIERS: Curing Agents-- for epoxies, amines (blocked); Epoxy Resins
-- curing agents for, amines (blocked); Amines-- blocked, curing agents
for epoxies; Water-borne Compositions-- epoxies, curing agents, amines
(blocked); Amines-- products, with carbonates/carbonyl/reactives

2/9/26 (Item 3 from file: 31)

DIALOG(R)File 31:World Surface Coatings Abs
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00520236 WSCA ABSTRACT NUMBER: 98-08562 WSCA ID NUMBER: 468562
Iminooxybenzyl compounds and their use as pesticides and fungicides.
PATENT ASSIGNEE: BASF AG;
PATENT INFORMATION: European Patent Application ,53 pp. (Also PCT
97/01545).
PATENT (NUMBER,DATE): EP 835250
JOURNAL ANNOUNCEMENT: 9811 WSCA UPDATE CODE: 9811
DOCUMENT TYPE: Patent LANGUAGE: German
SECTION (CODE,HEADING): 56 Fouling and Microbiological Attack

ABSTRACT: Benzyloxyimino)alkyltriazole derivatives are disclosed. They are
useful for protection of wood, e.g, against *Paecilomyces variotii*. The
compounds may be obtained by reacting benzyl compound as specified with
oxime or **reacting hydroxylamine** ether (of substituted benzyl alcohol)
with triazolyl ketone. (In German)

DESCRIPTORS: Biocides; Fungicides; Wood Preservatives; Triazoles
CHEMICAL NAMES: **aldoxime**; ketoxime; hydroxyl; amine; ether;
triazole; triazole; benzyl; oxime; benzyl alcohol
IDENTIFIERS: Biocides-- benzyl compounds, oximes links to triazoles;
Fungicides-- benzyl compounds, oximes links to triazoles; Wood
Preservatives-- benzyl compounds, oximes links to triazoles; Triazoles--
biocides, oximes links to benzyl
ADDITIONAL TERMS (IDENTIFIERS): wood preservative: wood substrate

2/9/27 (Item 4 from file: 31)

DIALOG(R)File 31:World Surface Coatings Abs
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00520235 WSCA ABSTRACT NUMBER: 98-08561 WSCA ID NUMBER: 468561
Iminooxymethylene anilides and their use as pesticides and fungicides.
PATENT ASSIGNEE: BASF AG;
PATENT INFORMATION: European Patent Application , 60 pp. (Also PCT
97/01544).
PATENT (NUMBER,DATE): EP 835249
JOURNAL ANNOUNCEMENT: 9811 WSCA UPDATE CODE: 9811
DOCUMENT TYPE: Patent LANGUAGE: German
SECTION (CODE,HEADING): 56 Fouling and Microbiological Attack

ABSTRACT: The compounds are
2-(1,2,4-triazolyl-3-methyleneaminooxymethyl)-N-hydroxyanilide derivatives.
They are useful for protection of wood, e.g, against *Paecilomyces variotii*.
The compounds may be obtained by reacting 2-methylanilide (the methyl
having a leaving group) as specified with oxime (salt) or by **reacting
hydroxylamine** ether (of 2-methylolanilide) with triazolyl ketone. (In
German)

DESCRIPTORS: Biocides; Wood Preservatives; Anilides; Fungicides;
Triazoles
CHEMICAL NAMES: ketoxime; **aldoxime**; anilide; triazole; oxime;
hydroxyl; amine; ether; 2-methylanilide; oxime; 2-methylolanilide
IDENTIFIERS: Biocides-- anilides, oximes links to triazoles; Wood
Preservatives-- anilides, oximes links to triazoles; Anilides--
biocides, oximes links to triazoles; Fungicides-- anilides, oximes links

to triazoles; Triazole - biocides, oximes links to an...des
ADDITIONAL TERMS (IDENTIFIERS): wood substrate; wood preservative

2/9/28 (Item 5 from file: 31)
DIALOG(R)File 31:World Surface Coatings Abs
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00510864 WSCA ABSTRACT NUMBER: 97-08897 WSCA ID NUMBER: 448897
Coating compositions containing polyisocyanates and aldimines which have improved storage stability.
PATENT ASSIGNEE: BAYER CORP;
PATENT INFORMATION: United States Patent : Off. Gaz. 1997, Vol 1198 No 2, 1184-5.
PATENT (NUMBER,DATE): US 5629403 19970000
PUBLICATION YEAR: 1997
JOURNAL ANNOUNCEMENT: 9712 WSCA UPDATE CODE: 9712
DOCUMENT TYPE: Patent LANGUAGE: English
SECTION (CODE,HEADING): 22 Nitrogenous Polymers

ABSTRACT: A coating composition which has an improved pot-life without a corresponding increase in dry time when cured under ambient conditions comprises a polyisocyanate component (I), an **aldimine** (II) based on the reaction product of a polyamine having 2 or more primary amino groups with an aldehyde, and 0.001-5 wt. %, based on the weight of (I) and (II), of a tin(IV) compound which is a catalyst for the **reaction** between isocyanate groups and **hydroxyl** groups.

DESCRIPTORS: Polyisocyanates; **Aldimines** ; Storage Stability; Pot-life
CHEMICAL NAMES: polyisocyanate; **aldimine** ; polyamine; aldehyde;

tin(IV)

IDENTIFIERS: Polyisocyanates-- coatings, **aldimines** /catalysts &, pot-life
; **Aldimines** -- coatings, polyisocyanates/catalysts &, pot-life;
Storage Stability-- polyisocyanates/ **aldimines** /catalysts; Pot-life--
polyisocyanates/ **aldimines** /catalysts

2/9/29 (Item 6 from file: 31)
DIALOG(R)File 31:World Surface Coatings Abs
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00509514 WSCA ABSTRACT NUMBER: 97-07547 WSCA ID NUMBER: 447547
Liquid coating material.
PATENT ASSIGNEE: HOECHST AG;
PATENT INFORMATION: European Patent Application , 9 pp.
PATENT (NUMBER,DATE): EP 481345
JOURNAL ANNOUNCEMENT: 9710 WSCA UPDATE CODE: 9710
DOCUMENT TYPE: Patent LANGUAGE: German
SECTION (CODE,HEADING): 64 Paints, Etc for Other Specific Uses

ABSTRACT: The liquid, pigmented, two-component compsns. are suitable for a primer or for a motor vehicle repair filling compsn. They cure rapidly at low temperature to solvent-resistant coatings on a range of substrates, but especially metals. They contain acetoacetate group-containing polymers (I) together with **aldimine** /ketimine-blocked polyamines. The polymers (I) are formed by **reaction** of a **polyepoxide** with water, amine or hydroxycarboxylic acid, followed by transesterification to introduce the acetoacetate groups. (In German)

DESCRIPTORS: Acetoacetate Groups; Epoxy Resins; Vehicles, Motor;
Primers; Filling Compositions; Amines
CHEMICAL NAMES: epoxy resin; bisphenol A; bisphenol F; alkanolamine;
hydroxycarboxylic acid; **aldimine** ; ketimine; amine; epoxide; water;
amine; carboxylic acid
IDENTIFIERS: Acetoacetate Groups-- epoxies (modified), coatings, amines
(blocked) &; Epoxy Resins-- modified, acetoacetate groups, coatings,
amines (blocked) &; Vehicles, Motor-- repair, filling compsns, epoxies

(modified); Primers-- oxies (modified), acetoacetate groups; Filling
Compositions-- vehicles (motor), epoxies (modified); Amines-- blocked,
coatings, epoxies/acetoacetate groups &
ADDITIONAL TERMS (IDENTIFIERS): metal substrate; steel substrate; wood
substrate; fabric substrate; plastics substrate; glass substrate;
ceramic substrate; solvent resistance; moisture-curable coating;
automobile

2/9/30 (Item 7 from file: 31)
DIALOG(R)File 31:World Surface Coatings Abs
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00504423 WSCA ABSTRACT NUMBER: 97-02456 WSCA ID NUMBER: 442456
Novel coating compositions which may be ambient cured.
PATENT ASSIGNEE: BASF CORP;
PATENT INFORMATION: European Patent Application , 17 pp.
PATENT (NUMBER,DATE): EP 531249
JOURNAL ANNOUNCEMENT: 9704 WSCA UPDATE CODE: 9704
DOCUMENT TYPE: Patent LANGUAGE: English
SECTION (CODE,HEADING): 34 Solvent-thinned Paints, High-solids Coatings,
Etc

ABSTRACT: The room temperature-curable coating compsns are useful for
refinishing, and also as stoving compsns. They have low volatile organic
compounds (VOCs) content and good spraying viscosity, and relatively high
solids content. The coatings have improved chemical and water resistance.
The compsns comprise at least one hydroxyl-functional resin, at least one
isocyanate-functional resin, a cure accelerator comprising an **aldimine** or
ketimine, and optionally a **reactive** diluent. The **hydroxyl** -functional
resin is preferably a saturated or unsaturated polyester resin with
hydroxyl value 20-200, the isocyanate-functional resin is most preferably a
dimer and/or trimer of hexamethylene diisocyanate, and the **reactive**
diluent is secondary amine **hydroxyl** or oxazolidine functional **reactive**
diluent.

DESCRIPTORS: High-solids Coatings; Vehicles, Motor; Curing Accelerators;
Polymers, Hydroxylated; Curing Accelerators; **Aldimines** ; Ketimines
CHEMICAL NAMES: hydroxyl; isocyanate; **aldimine** ; ketimine; polyester;
hexamethylene diisocyanate; amine; oxazolidine
IDENTIFIERS: High-solids Coatings-- polymers (hydroxylated), isocyanate
groups/ **aldimines** etc & ; Vehicles, Motor-- refinishing, high-solids
coatings, polymers (hydroxylated)/isocyanate groups etc; Curing
Accelerators-- **aldimines** ; Polymers, Hydroxylated-- high-solids
coatings, isocyanate groups/ **aldimines** etc & ; Curing Accelerators--
ketimines; **Aldimines** -- curing accelerators; Ketimines-- curing
accelerators
ADDITIONAL TERMS (IDENTIFIERS): motor vehicle refinishing; automobile;
heat-curable compsn; sprayable; high-solids coatings; chemical
resistance; hydroxylated polymer; curing accelerated

2/9/31 (Item 8 from file: 31)
DIALOG(R)File 31:World Surface Coatings Abs
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00501749 WSCA ABSTRACT NUMBER: 96-09235 WSCA ID NUMBER: 429235
Aluminium complexes useful for cross-linking coating compositions.
PATENT ASSIGNEE: RHONE-POULENC CHEMICALS LTD;
PATENT INFORMATION: British Patent Application , 30 pp.
PATENT (NUMBER,DATE): GB 2269169
JOURNAL ANNOUNCEMENT: 9612 WSCA UPDATE CODE: 9610
DOCUMENT TYPE: Patent LANGUAGE: English
SECTION (CODE,HEADING): 08 Driers and Minor Additives
SECTION CODE CROSS-REFERENCE: 18; 34;

ABSTRACT: The complexes are useful as driers and rheology modifiers in

high-solids (alkyd) coating compns. They have a reduced tendency to react with the resin in the coating compsn. during storage, impart little or no odour and do not cause yellowing in coatings containing them. The complexes are obtained by reacting a volatile ketoxime or **aldoxime** with the **reaction** product of an aluminium **alkoxide** or phenoxide, an enolisable beta-diketone compound and/or carboxylic acid and optionally water. The beta-diketo compound is exemplified by acetylacetone, benzoyl stearyl methane and octyl acetoacetate.

DESCRIPTORS: Aluminium; Driers; Oximes; Flow Control Agents;
High-solids Coatings; Alkyd Resins
CHEMICAL NAMES: 1-PHENYLEICOSA-1,3-DIONE; ACETYLACETONE; ALKYD RESIN;
ALUMINIUM; ALUMINIUM ALKOXIDE; BETA-DIKETONE; BETA-KETOESTER;
CARBOXYLIC ACID; DIKETONE (BETA-); ENOL; ERUCIC ACID; ETHYL
ACETOACETATE; OCTYL ACETOACETATE; PHENOXIDE; SOYA FATTY ACID
IDENTIFIERS: Aluminium-- complexes, from oximes/alcoholates etc/diketo etc
; Driers-- aluminium, complexes, from oximes/alcoholates etc/diketo etc;
Oximes-- products, with aluminium compounds/diketo etc; Flow Control
Agents-- aluminium complexes, from oximes/alcoholates etc; High-solids
Coatings-- aluminium complexes; Alkyd Resins-- high-solids coatings,
aluminium complexes etc &
ADDITIONAL TERMS (IDENTIFIERS): high-solids coating; viscosity;
yellowing resistance

2/9/32 (Item 9 from file: 31)
DIALOG(R)File 31:World Surface Coatings Abs
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00433512 WSCA ABSTRACT NUMBER: 90-01052 WSCA ID NUMBER: 301052
Coating resin composition.
PATENT ASSIGNEE: KANSAI PAINT CO;
PATENT INFORMATION: European Patent Application ,.11 pp.
PATENT (NUMBER,DATE): EP 315164
JOURNAL ANNOUNCEMENT: 9002 WSCA UPDATE CODE: 8912
DOCUMENT TYPE: Patent LANGUAGE: English
SECTION (CODE,HEADING): 36 Water-borne Paints and their Components
SECTION CODE CROSS-REFERENCE: 18;

ABSTRACT: A resin, especially for cathodic electrocoating, comprises mainly a resin obtained by adding an amine having active hydrogen to an epoxy resin produced by **reaction** of a **diepoxide** (a diglycidyl ether of an alkylene oxide-modified bisphenol A), a bisphenol, a bisphenol diglycidyl ether (as required) and an amine e.g. a ketimine of diethylenetriamine. Thick films with improved resistance may be formed.

DESCRIPTORS: Epoxy/Amine Adducts; Electrocoating, Cathodic;
Electrocoating, Cathodic; Thick Coatings
BRAND/PRODUCT NAMES: NOIGEN; XB-4122; SANNIX PP4000; GLYCI- ALE
BPP-350
CHEMICAL NAMES: EPOXY/AMINE ADDUCT; GLYCIDYL ETHER; PROPYLENE OXIDE;
KETIMINE; DIETHYLENETRIAMINE; ALKYLENE OXIDE; EPOXY RESIN; BISPHENOL
A; AMINE
IDENTIFIERS: Epoxy/Amine Adducts-- from epoxies from alkoxyated
bisphenols; Electrocoating, Cathodic-- epoxy/amine adducts;
Electrocoating, Cathodic-- thick films; Thick Coatings-- electrocoating
(cathodic)
ADDITIONAL TERMS (IDENTIFIERS): thick film; corrosion resistance;
water-borne coating

2/9/33 (Item 10 from file: 31)
DIALOG(R)File 31:World Surface Coatings Abs
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00392373 WSCA ABSTRACT NUMBER: 86-00041 WSCA ID NUMBER: 220041
Aldol condensations on basic alumina: a facile route to enone systems in

solvent-free media.

VARMA R S; KABALKA G W; PAGNI R M; EVANS L T

ACS, Abs of Papers, 189th Meeting, Miami 1985, Div. of Organic Chem, Abs 123.

1985

JOURNAL ANNOUNCEMENT: 8601 WSCA UPDATE CODE: 8513

DOCUMENT TYPE: Conference LANGUAGE: English

SECTION (CODE,HEADING): 05 Solvents, Plasticisers and Intermediates

ABSTRACT: The solventless formation of chalcones by condensations of benzaldehyde with ketones is reported and discussed.

DESCRIPTORS: Benzaldehyde; Ketones; Aluminium Oxide

CHEMICAL NAMES: BENZALDEHYDE; KETONE; CHALCONE

IDENTIFIERS: Benzaldehyde-- reaction, with ketones; Ketones-- reaction, with benzaldehyde; Aluminium Oxide -- reactions on

2/9/34 (Item 11 from file: 31)

DIALOG(R)File 31:World Surface Coatings Abs

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00332353 WSCA ABSTRACT NUMBER: 79-07324 WSCA ID NUMBER: 87324

Mechanism of inhibition of oxidation reactions by metal complexes. II.

Effect of substituents in imino component of Schiff's base on anti-oxygenic properties of copper salicylaldiminates .

KOVTUN G A; LYSENKO D L; BERENBLYUM A S; MOISEEV I I

Izv. Akad. Nauk, Ser. Khim. 1979, No 2, 293-7.

1979

JOURNAL ANNOUNCEMENT: 7911 WSCA UPDATE CODE: 7900

DOCUMENT TYPE: Journal LANGUAGE: Russian

SECTION (CODE,HEADING): 01 Pigments, Extenders, Dyestuffs and Phosphors

ABSTRACT: It was shown that copper bis- **salicylaldiminates** participate in multiple ways in the oxidation inhibition mechanism of cyclohexylamine following a **reaction** with alpha- **aminoperoxide** radicals. The measured constants of the rate of single-electron oxidation and the reduction of alpha-aminoperoxide radicals in copper complexes decrease with an increase in the electron donor capacities of the substituents in the imino components of a Schiff's base. The measured constants of the rate of rupture of the chains among p,p'-substituted diphenyl amines increase with a rise in the electron donor capacity of the substituents. (In Russian)

DESCRIPTORS: OXIDATION; COPPER; AZOMETHINE COMPOUNDS

CHEMICAL NAMES: IMINO; RADICAL; COPPER; SCHIFF'S BASE; AZOMETHINE; CYCLOHEXYLAMINE

IDENTIFIERS: INHIBITION OF OXIDATION BY COMPLEXES OF COPPER WITH AZOMETHINE COMPOUNDS

ADDITIONAL TERMS (IDENTIFIERS): INHIBIT; MEASURED; REACTION;

SUBSTITUENT; DONOR; ELECTRON; CHAIN; CONSTANT; MULTIPLE; OXIDATION;

EFFECT; SUBSTITUTED; PROPERTY; COMPONENT; DECREASE; METAL;

ELECTRON DONOR; RUPTURE; RISE; PARTICIPATE; RATE; INCREASE;

REDUCTION; MECHANISM; WAYS

2/9/35 (Item 1 from file: 35)

DIALOG(R)File 35:Dissertation Abs Online

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01743435 ORDER NO: AADAA-I9969397

Chemistry at oxide surfaces: Reaction of water and HCl on alpha aluminum oxide(0001) and atomic layer deposition of tungsten

Author: Nelson, Christine Elizabeth

Degree: Ph.D.

Year: 1999

Corporate Source/Institution: University of Colorado at Boulder (0051)

Directors: Steven M. George; Margaret A. Tolbert

Source: VOLUME 61/04-B OF DISSERTATION ABSTRACTS INTERNATIONAL.

Descriptors: CHEMISTRY, PHYSICAL ; ENGINEERING, MATERIALS SCIENCE

Descriptor Codes: 0494; 0794

ISBN: 0-599-74264-X

The adsorption and desorption of H_2O and HCl on $\alpha-Al_2O_3$ (0001) were examined using laser induced thermal desorption (LITD) and temperature programmed desorption (TPD) techniques. The initial sticking coefficient for H_2O on $\alpha-Al_2O_3$ (0001) was ~ 0.1 at 298 K. The HCl sticking coefficient on $\alpha-Al_2O_3$ (0001) was 10^{-3} at 298 K. For both H_2O and HCl , the sticking coefficient decreases almost exponentially with coverage. The H_2O and HCl desorption occurs over a broad temperature range of ~ 300 K to 600 K. This broad range suggests a distribution of surface sites with different binding energies. The H_2O and HCl desorption results versus coverage prepared by progressively annealing a fully exposed $\alpha-Al_2O_3$ (0001) surface confirmed a wide range of binding energies. Additional TPD results showed that the H_2O and HCl randomly fill these sites independent of their adsorption energy. These results also suggest that surface diffusion between the adsorption sites must be negligible. Modeling of the H_2O TPD data give a desorption energy range from 23–41 kcal/mol. The HCl model TPD data give a desorption energy range from 19–36 kcal/mol.

In addition to studying the H_2O and HCl reactions on Al_2O_3 , the atomic layer deposition of tungsten was examined on Al_2O_3 and SiO_2 . The atomic layer deposition of tungsten can be achieved by separating the CVD reaction $WF_6 + Si_2H_6 \rightarrow W + 2SiHF_3 + 2H_2$ into two half-reactions. Successive application of the WF_6 and Si_2H_6 half-reactions in an ABAB sequence produces W atomic layer controlled growth. The nucleation and growth of W on SiO_2 and Al_2O_3 was examined using Auger electron spectroscopy. Auger electron spectroscopy studies at 473 K and 573 K reveal an initial nucleation phase that is followed by a layer-by-layer W growth regime. The Auger data is fit well assuming a Frank van der Merwe layer-by-layer growth. These studies reveal that the sequential surface reactions can facilitate metal wetting of oxide surfaces and conformal layer-by-layer metal growth.

2/9/36 (Item 2 from file: 35)

DIALOG(R)File 35:Dissertation Abs Online

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01733433 ORDER NO: AADAA-I9961649

Reactions of volatile organic compounds in the atmosphere: Ozone-alkene reactions

Author: Fenske, Jill Denise

Degree: Ph.D.

Year: 2000

Corporate Source/Institution: University of California, Los Angeles (0031)

Chairs: Selim M. Senkan; Suzanne E. Paulson

Source: VOLUME 61/02-B OF DISSERTATION ABSTRACTS INTERNATIONAL.

PAGE 960. 147 PAGES

Descriptors: ENGINEERING, CHEMICAL ; CHEMISTRY, ORGANIC ; PHYSICS, ATMOSPHERIC SCIENCE ; ENVIRONMENTAL SCIENCES

Descriptor Codes: 0542; 0490; 0608; 0768

Photochemical smog cannot form without sunlight, nitrogen oxides, and volatile organic compounds (VOC). This dissertation addresses several different aspects of VOC chemistry in the atmosphere.

Aside from ambient levels of VOC outdoors, VOC are also present at moderate concentrations indoors. Many studies have measured indoor air concentrations of VOC, but only one considered the effects of human breath.

mechanisms that may contribute to the cytoprotective properties of PTU.

Induction of the microsomal enzymes cytochrome P4502E1 (CYP2E1) and NADPH-cytochrome P450 reductase (CYP-reductase) may be involved in the pathogenesis of **ALD**, since they can generate free radicals and **reactive** metabolites, and contribute to **oxygen** depletion. Initial studies examined the potential of PTU to inhibit CYP-reductase, a rate-limiting enzyme in P450-catalyzed reactions, as a potential mechanism underlying the hepatoprotective effect of PTU. Liver microsomes isolated from chronic ethanol-treated rats showed increased levels of CYP2E1 and enhanced rates of oxygen consumption, hydroxyl radical formation and ethanol oxidation. These effects were attenuated in the microsomes of rats treated with PTU, in parallel with reductions in the levels and activity of CYP-reductase.

Neutrophil infiltrates in the liver and elevated levels of circulating neutrophils are characteristic of **ALD**. Neutrophils can injure host cells by releasing **reactive oxygen** species and proteolytic enzymes. Studies were conducted to determine whether PTU could lower circulating neutrophil counts and thereby protect against liver injury. Chronic intragastric ethanol infusion resulted in liver injury accompanied by an increase in circulating neutrophils. Administration of PTU to ethanol-fed rats did not alter circulating neutrophil counts.

Studies further examined the potential of PTU to modulate neutrophil oxidant formation and proteolytic enzyme activity. Myeloperoxidase is a neutrophil enzyme that generates **reactive oxygen** species and renders cells more susceptible to proteolytic injury by inactivating α_1 -proteinase inhibitor (A1PI). Studies with rat neutrophils showed that, at clinically relevant concentrations, PTU was a potent inhibitor of myeloperoxidase and prevented both the formation of hypochlorous acid and the inactivation of A1PI by neutrophils.

These studies indicate that the ability of PTU to (a) counteract the induction of CYP2E1 via CYP-reductase down-regulation and (b) limit the toxic potential of neutrophils are probable mechanisms contributing to the drug's therapeutic effect in **ALD** patients.

2/9/39 (Item 5 from file: 35)
DIALOG(R) File 35:Dissertation Abs Online
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01563285 ORDER NO: AAD97-19353

**ADSORBATE-SUBSTRATE INTERACTIONS ON BOTH SILICON AND COPPER SURFACES
(ALKYLSILANES)**

Author: FOSTER, MICHELLE CHRISTINE

Degree: PH.D.

Year: 1996

Corporate Source/Institution: THE UNIVERSITY OF TEXAS AT AUSTIN (0227)

Supervisor: ALAN CAMPION

Source: VOLUME 58/01-B OF DISSERTATION ABSTRACTS INTERNATIONAL.

PAGE 216. 164 PAGES

Descriptors: CHEMISTRY, PHYSICAL ; ENGINEERING, MATERIALS SCIENCE

Descriptor Codes: 0494; 0794

Adsorbate-surface interactions were examined on two different substrates. On the silicon surface, three series of experiments were performed. First, the surface chemistry of different ethyl containing silanes was investigated on the Si (100) 2 x 1 reconstructed surface to evaluate the ethylsilanes as silicon **ALE** precursors. Second, the decomposition mechanisms of alkylsilanes was studied to determine the differences in temperature of the β -hydride elimination reaction on the Si (100) 2 x 1 surface. Finally, the ability to use alkylsilanes to grow epitaxial silicon on the silicon dioxide surface was studied. On Cu (111), the mechanism of the charge transfer interactions between pyromellitic dianhydride and the copper substrate was investigated.

The surface chemistry of ethylsilane, diethylsilane, triethylsilane and tetraethylsilane was studied using Temperature Programmed Desorption Mass Spectrometry and High Resolution Electron Energy Loss Spectroscopy. Both ethylsilane and diethylsilane adsorb dissociatively on the Si (100) 2 x 1 reconstructed surface at room temperature with all ligands retained by

the surface to a saturation coverage of $\theta_{\text{Si}} = 0.25 \text{ ML}$. Triethylsilane does not reach saturation under these experimental conditions. Tetraethylsilane does not react at all with the Si (100) 2×1 surface. Thermal decomposition of ethylsilane, diethylsilane and triethylsilane proceeds by a β -hydride elimination mechanism, resulting in the loss of the ethyl group as ethylene at 700 K. The eliminated hydrogen adsorbs onto the surface as the 2×1 monohydride and subsequently desorbs at 800 K, leaving behind a clean, carbon-free silicon surface.

The decomposition trends of the following alkylsilane precursors were studied using TPDMS and HREELS. Diethylsilane undergoes β -hydride elimination at a temperature of 700 K. Di-isobutylsilane also undergoes a β -hydride elimination; however, the elimination temperature has been reduced by 65 K to 635 K while the hydrogen desorption temperature remains constant at 800 K. Dimethylsilane decomposes via dehydrogenation of the methyl group, with the only desorption product being hydrogen, which desorbs as the silicon monohydride, with a temperature shift observed as a function of available surface sites.

The growth possibilities of the different alkylsilanes on the native silicon oxide surface was studied using HREELS. At 100 and 300 K, none of the alkylsilanes studied, namely ethylsilane, diethylsilane, dimethylsilane and di-isobutylsilane, reacted with the oxide surface.

A study of the chemical enhancement contribution to the surface enhanced Raman effect seen with monolayer coverages of pyromellitic dianhydride (PMDA) on Cu (111). This work was done in collaboration with Craig Child. Electronic EELS studies of PMDA adsorbed on Cu (111) show a low energy, charge transfer absorption feature centered at 1.9 eV, which was a result of dipole scattering from a surface complex. Model compound EELS studies of phthalic anhydride, benzoic acid, and trimellitic acid anhydride demonstrated the importance of the creation of a phenyl radical during adsorption in the formation of a charge transfer state. Electronic EELS studies of PMDA on Cu (100) demonstrated that the charge transfer feature was not restricted to the (111) face of copper. A charge transfer peak was seen at 1.9 eV for PMDA chemisorbed on the Cu (100) surface.

2/9/40 (Item 6 from file: 35)
DIALOG(R) File 35:Dissertation Abs Online
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01510459 ORDER NO: AAD96-32839

**GENETIC DISSECTION OF ATHEROSCLEROSIS-RELATED TRAITS USING THE MOUSE MODEL
(CORONARY HEART DISEASE, LIPOFUSCIN)**

Author: WELCH, CARRIE LYNN

Degree: PH.D.

Year: 1996

Corporate Source/Institution: UNIVERSITY OF CALIFORNIA, LOS ANGELES (0031)

Chairs: ALDONS J. LUSIS; JUDY BERLINER

Source: VOLUME 57/06-B OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 3548. 195 PAGES

Descriptors: BIOLOGY, GENETICS ; HEALTH SCIENCES, PATHOLOGY

Descriptor Codes: 0369; 0571

The risk of developing atherosclerosis, the primary cause of coronary heart disease, is determined by a large number of interacting traits that are influenced by both genetic and environmental factors. The analysis of such complex traits is simplified in animal models. Large differences exist among inbred strains of mice in susceptibility to the development of atherosclerotic lesions. I have utilized the mouse model to identify and map genes which contribute to lipoprotein metabolism and atherosclerosis.

Using a cross between two inbred strains which differ in lipofuscin deposition, a determinant of the trait was mapped to mouse Chromosome (Chr.) 7 and identified as the tyrosinase gene (Tyr). Coincidence of lipofuscin deposition and atherosclerotic lesion formation was observed in a strain relatively resistant to both traits. Furthermore, a 36% decrease in lesion size in the mutant strain ($p < .02$ vs. wild-type plus

heterozygous controls) following 15 week feeding of an atherogenic diet suggested that Tyr contributes to atherosclerotic lesion development in mice, possibly through the deposition of lipofuscin and subsequent generation of **reactive oxygen** species.

Previous epidemiological studies indicated that the most important risk factors for atherosclerosis are related to lipoprotein metabolism. While many of the rare single gene defects resulting in severe disease have been identified, few of the common genetic variations contributing to risk of disease in the general population are known. Using and interspecific backcross mapping panels and several recombinant inbred strains, 15 candidate genes for cholesterol homeostasis were mapped by linkage analysis. One of the genes, *Acact*, mapped near *ald*, a mouse variation resulting in abnormal cholesteryl ester storage.

Segregation analysis of a cross between two strains which differ in plasma lipoprotein levels identified 7 quantitative trait loci (QTLs), on Chrs. 6, 12, 13, 15, and 19, contributing to subtle variations between the strains. Some of these QTLs have been identified in other mouse crosses, and some of them are novel loci. Alignment of the candidate gene and QTL maps revealed a number of interesting candidate genes which may contribute to the plasma cholesterol variations, some of which have been implicated in human lipoprotein disorders.

2/9/41 (Item 7 from file: 35)

DIALOG(R) File 35:Dissertation Abs Online

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01428040 ORDER NO: AADAA-I9526404

HETEROEPITAXIAL GROWTH OF CADMIUM TELLURIDE ON GALLIUM ARSENIDE AND SILICON SUBSTRATES

Author: WANG, WEN-SHENG

Degree: PH.D.

Year: 1994

Corporate Source/Institution: RENSSELAER POLYTECHNIC INSTITUTE (0185)

Adviser: ISHWARA B. BHAT

Source: VOLUME 56/04-B OF DISSERTATION ABSTRACTS INTERNATIONAL.

PAGE 2238. 188 PAGES

Descriptors: ENGINEERING, ELECTRONICS AND ELECTRICAL; ENGINEERING, MATERIALS SCIENCE

Descriptor Codes: 0544; 0794

Methods for growing high quality epitaxial layers of CdTe on GaAs and Si substrates are described and presented in this thesis. The techniques developed involve **atomic layer epitaxy (ALE)** of CdTe on GaAs and in-situ cleaning of the Si surface using germane gas (GeH_4) at low temperature. The underlying reasons for the success of these methods are studied and described in detail.

ALE of CdTe on GaAs has been carried out using dimethylcadmium (DMCd) and diethyltelluride (DETe) as precursors. Self-limiting growth at one monolayer per cycle was obtained over the temperature range from 280°C to 320°C, under a wide range of precursor pressure conditions. A study of the growth mechanism indicates that the decomposition of DMCd into Cd is the rate limiting step and that the decomposition of the Te precursor is catalyzed on the Cd covered surface. A significant improvement in the surface morphology and crystal quality was observed when the initial CdTe nucleation step was carried out using the **ALE** method, prior to deposition of CdTe by conventional vapor phase epitaxy (VPE).

When CdTe is grown directly on Si, only polycrystalline films were obtained. To obtain high quality CdTe on Si, a Ge buffer layer was first grown using germane gas. In the growth of Ge on Si, it was observed that germane gas can etch Si native **oxide** at low temperature. The detailed **reaction** mechanism will be presented in this talk. Epitaxial (100) CdTe and ZnTe layers with high crystalline quality and featureless surface morphology have been routinely grown on (100) Si using this GeH_4 in-situ cleaning process. Double crystal rocking curves with full width at half maximum (FWHM) of 200 arcsec have been obtained for a 5 μm thick

CdTe. This study demonstrated a novel in-situ Si cleaning step without a high temperature deoxidation process to grow high quality CdTe on Si in a single reactor.

2/9/42 (Item 8 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online
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1016703 ORDER NO: AAD88-08522

ENZYMIC PHOSPHORYL TRANSFER TO CARBON AND OXYGEN ACCEPTORS: AN INVESTIGATION OF THE BIOSYNTHESIS OF 2-AMINOETHYLPHOSPHONIC ACID IN TETRAHYMENA PYRIFORMIS W. AND THE KINETIC MECHANISM AND COFACTOR CONTROLLED SUBSTRATE SPECIFICITY OF YEAST INORGANIC PYROPHOSPHATASE

Author: BARRY, ROBERT JOEL

Degree: PH.D.

Year: 1987

Corporate Source/Institution: UNIVERSITY OF MARYLAND (0117)

DIRECTOR: DEBRA DUNAWAY-MARIANO

Source: VOLUME 49/06-B OF DISSERTATION ABSTRACTS INTERNATIONAL.

PAGE 2162. 240 PAGES

Descriptors: CHEMISTRY, BIOCHEMISTRY

Descriptor Codes: 0487

The research described in this dissertation is concerned with the study of two enzymatic systems which catalyze phosphoryl transfer reactions to carbon and oxygen acceptors. The first portion of this dissertation is concerned with the elucidation of the *T. pyriformis* 2-aminoethylphosphonate (AEP) biosynthetic pathway. The de novo formation of AEP (and purported metabolic intermediates) from exogenously added precursors in *Tetrahymena* cell-free preparations was evaluated by using radioisotopic techniques and NMR spectral analysis. Incubation of (^{32}P) -phosphoenolpyruvate (PEP) with cell-free preparations yielded (^{32}P) -labelled material that was chromatographically identical to authentic phosphoenolpyruvate (p-pep). A reexamination of AEP biosynthesis was initiated. It was first shown that cellular homogenates could consistently convert (^{32}P) -labelled orthophosphate ($\text{P}(\text{O})_4^{3-}$) and PEP, and (^{14}C) -labelled PEP to radiolabelled AEP. Subcellular fractions, generated from cell-free preparations by using differential centrifugation, were examined for AEP forming capability. Incubation of (^{32}P) -PEP with 110,000g microsomes resulted in the formation of (^{32}P) -labelled material chromatographically identical to authentic p-pep that was resistant to exhaustive phosphatase activity compared to a control. Separately, PEP, p-pep and phosphonoacetaldehyde (p-ald) were tested directly as AEP precursors. Incubation of PEP, p-pep and p-ald with the microsomal fraction in the presence of added transaminating reagents yielded 1.4, 1.6 and 3.4% AEP relative to the concentration of the respective precursors. The AEP reaction product, which was identified and quantitated using (^{31}P) -NMR spectral analysis, was also further characterized using ^1H - and ^{13}C -NMR.

In the second portion of this dissertation the kinetic mechanism of yeast inorganic pyrophosphatase (PPase) was examined by carrying-out initial velocity studies. Ca^{2+} and $\text{Rh}(\text{H}_2\text{O})_4(\text{methylenediphosphonate})$ ($\text{Rh}(\text{H}_2\text{O})_4\text{PCP}$) were used as dead-end inhibitors to study the order of binding of $\text{Cr}(\text{H}_2\text{O})_4\text{PP}$ to the substrate site and Mg^{2+} to the "low affinity" activator site on the enzyme. The role of the metal cofactor in determining PPase substrate specificity was briefly explored by testing the ability of the Mg^{2+} complex of tripolyphosphate ($\text{PPP}(\text{O})_3^{3-}$) (a substrate for the Zn^{2+} activated enzyme but not the Mg^{2+} activated enzyme) to induce Mg^{2+} inhibition of PPase catalyzed hydrolysis of MgPP . (Abstract shortened with permission of author.)

2/9/43 (Item 9 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online
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STUDIES ON NADH(NADPH)-CYTOCHROME C REDUCTASE FROM YEAST (FLAVOENZYME, ENZYME KINETICS)

Author: JOHNSON, MARK STEPHEN

Degree: PH.D.

Year: 1984

Corporate Source/Institution: THE UNIVERSITY OF UTAH (0240)

Source: VOLUME 45/01-B OF DISSERTATION ABSTRACTS INTERNATIONAL.

PAGE 158. 243 PAGES

Descriptors: CHEMISTRY, BIOCHEMISTRY

Descriptor Codes: 0487

An NADH(NADPH)-cytochrome c reductase has been isolated from an acetone powder of a top ale yeast with a purification of 67-fold, a recovery of 23%, and a final specific activity of 0.406 moles min⁻¹ mg (U/mg), and 0.312 U/mg for NADH- and NADPH-dependent reduction, respectively. The enzyme was homogeneous on gels, had a molecular weight 70,000 daltons, and was composed of 2 identical subunits with 0.63 residues FMN, no metals, and 1 sulfhydryl per subunit. The pI was 5.25 ((GAMMA)/2 = 0.05) and the pH optimum was 7.7. The absorbance spectra showed peaks at 464 nm, 383 nm, and 278 nm (11.1:1:1.1). Anaerobic titration with dithionite or NAD(P)H showed a 2-electron reduction, with no FMN-semiquinone intermediate. Kinetics revealed a 3-substrate random-ordered hybrid mechanism, and the kinetic parameters were derived. Arrhenius plots showed large differences between NADH and NADPH as the substrate-reductant. Menadione accelerated cytochrome c reduction, but vitamin K(1) and coenzyme Q(10) were ineffective. With NADPH, the relative rates of reduction were ferricyanide > DCIP > cytochrome c > oxygen; with menadione the specificity sequence was cytochrome c > ferricyanide > DCIP > oxygen. Utilizing NADH, ferricyanide > cytochrome c > oxygen > DCIP, which changed to cytochrome c > ferricyanide > oxygen > DCIP with menadione. Cytochrome b(5) was reduced anaerobically. No transhydrogenase activity was seen. Superoxide dismutase inhibited cytochrome c reduction by 50%, but O(2)('-) was not necessary for cytochrome c reduction. The product of the reaction with oxygen was H(2)O(2).

2/9/44 (Item 1 from file: 94)

DIALOG(R) File 94:JICST-EPlus

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02234285 JICST ACCESSION NUMBER: 94A0895296 FILE SEGMENT: JICST-E

In-Situ Observation for Atomic Layer Deposition of Metal Oxides by a Spectroscopic Ellipsometer.

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(1) Riken Inst. of Phys. and Chem. Res.

Reza Kagaku Kenkyu(Laser Science Progress Report of IPCR), 1994, NO.16,

PAGE.56-58, FIG.4, REF.10

JOURNAL NUMBER: G0834BAK ISSN NO: 0289-8411

UNIVERSAL DECIMAL CLASSIFICATION: 539.23:54-31

LANGUAGE: Japanese

COUNTRY OF PUBLICATION: Japan

DOCUMENT TYPE: Journal

ARTICLE TYPE: Original paper

MEDIA TYPE: Printed Publication

ABSTRACT: In-situ diagnostics for controlled growth of metal oxides such as aluminum oxide with surface chemical reactions was successfully conducted with a spectroscopic ellipsometer. It was found that self-limiting growth of aluminum oxide films at room temperature was clearly observed in binary vapors of trimethylaluminum and hydrogen peroxide, while any growth to the film was not observed in a single vapor. (author abst.)

DESCRIPTORS: film thickness; aluminum oxide; thin film growth; substrate(plate); atomic layer epitaxy; silicon; hydrogen peroxide; organoaluminum compound; ellipsometer; in situ observation;

refractive index; frequency dependence; time dependent process
control; computing control

BROADER DESCRIPTORS: thickness; length; geometric quantity; aluminum compound; 3B group element compound; metal oxide; oxide; chalcogenide; oxygen group element compound; oxygen compound; plate classified by application; plate(material); epitaxy; crystal growth; third row element; element; carbon group element; peroxide(inorganic); hydrogen compound; organometallic compound; optical measuring instrument; measuring instrument; optical instrument; observation and view; ratio; dependence; control; computer application; utilization; automatic control

CLASSIFICATION CODE(S): BK14050P

2/9/45 (Item 1 from file: 144)

DIALOG(R) File 144:Pascal

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15434742 PASCAL No.: 02-0126716

Epitaxial growth of TiO SUB 2 films in a hydroxyl-free atomic layer deposition process

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Journal: Journal of crystal growth, 2002 235 (1-4) 293-299

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354000102220820470

No. of Refs.: 24 ref.

Document Type: P (Serial) ; A (Analytic)

Country of Publication: Netherlands

Language: English

This study demonstrates that TiI SUB 4 -O SUB 2 is a well working precursor system for epitaxial growth of titanium oxide films in an **atomic layer deposition** process that is not based on **reactions** with surface **hydroxyl** groups. Rutile and anatase were found to grow epitaxially on alpha -Al SUB 2 O SUB 3 (012) and MgO(001), respectively. The epitaxial relationships were determined by phi -scan and were found to be (010) SUB r SUB u SUB t SUB i SUB l SUB e parallel (100) SUB alpha SUB - SUB A SUB l SUB 2 SUB O SUB 3 ; (101) SUB r SUB u SUB t SUB i SUB l SUB e parallel (121) SUB alpha SUB - SUB A SUB l SUB 2 SUB O SUB 3 for the rutile films grown on alpha -Al SUB 2 O SUB 3 (012) and (010) SUB a SUB n SUB a SUB t SUB a SUB s SUB e parallel (010) SUB M SUB g SUB O and (001) SUB a SUB n SUB a SUB t SUB a SUB s SUB e parallel (100) SUB M SUB g SUB O for the anatase films grown on MgO(001). These relationships were also confirmed by TEM. For the anatase films grown at higher temperatures, small amounts of rutile were present. The TEM investigation showed that the rutile phase was situated in the grain boundaries between the anatase grains.

English Descriptors: Experimental study; Crystal growth from vapors; Epitaxy; Atomic layer method; Hot wall growth; Thin films; Titanium oxides; Rutile; Anatase; Crystal orientation; Orientation relation; Substrates; Temperature effects; Fabrication structure relation
Broad Descriptors: Inorganic compounds; Transition element compounds; Compose mineral; Metal transition compose

French Descriptors: Etude experimentale; Croissance cristalline en phase vapeur; Epitaxie; Methode couche atomique; Methode paroi chaude; Couche mince; Titane oxyde; Rutile; Anatase; Orientation cristalline; Relation orientation; Substrat; Effet temperature; Relation fabrication structure; 8115K; TiO2; O Ti; Substrat MgO; Substrat Al2O3

Classification Codes: 001B80A15K

2/9/46 (Item 2 from file: 144)
DIALOG(R) File 144:Pascal
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15432410 PASCAL No.: 02-0124259

Mechanism of atomic layer deposition of SiO SUB 2 on the silicon (100)-2x1 surface using SiCl SUB 4 and H SUB 2 O as precursors

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Journal: Journal of applied physics, 2002-03-01 91 (5) 3408-3414

ISSN: 0021-8979 CODEN: JAPIAU Availability: INIST-126

Document Type: P (Serial) ; A (Analytic)

Country of Publication: United States

Language: English

We use density functional theory to investigate atomic layer deposition (ALD) mechanism of silicon dioxide on the Si(100)-2x1 surface from the precursors SiCl SUB 4 and H SUB 2 O. First, we explore the reaction mechanism of water with the bare Si(100)-2x1 surface to produce surface hydroxyl groups. We find that this reaction proceeds through a two-step pathway with an overall barrier of 33.3 kcal/mol. Next, we investigate the ALD mechanism for the binary reaction sequence: the SiCl SUB 4 half reaction and the H SUB 2 O half reaction. For the SiCl SUB 4 half reaction, SiCl SUB 4 first forms a sigma-bond with the oxygen of the surface OH group and then releases an HCl molecule. The predicted barrier for this process is 15.8 kcal/mol. Next, adsorbed SiCl SUB 3 reacts with a neighboring OH group to form bridged SiCl SUB 2 with a barrier of 22.6 kcal/mol. The H SUB 2 O half reaction also proceeds through two sequential steps with an overall barrier of 19.1 kcal/mol for the reaction of H SUB 2 O with bridged SiCl SUB 2 to form bridged Si(OH) SUB 2. The predicted barrier of 22.6 kcal/mol for the rate-limiting step of the ALD binary reaction mechanism is consistent with the experimental value of 22.0 kcal/mol. In addition, we find that the calculated frequencies are in good agreement with the experimentally measured IR spectra. (c) 2002 American Institute of Physics.

English Descriptors: Theoretical study; Silicon compounds; Silicon; Elemental semiconductors; Atomic layer epitaxial growth; Surface chemistry; Surface reconstruction; Surface energy; Density functional method; Chemisorption

French Descriptors: 6855A; 6843M; 6835M; 8115G; 6835B; Etude theorique; Silicium compose; Silicium; Semiconducteur elementaire; Methode ALE ; Chimie surface; Reconstruction surface; Energie surface; Methode fonctionnelle densite; Chimisorption

Classification Codes: 001B80A15A; 001B60H45D; 001B60H35M; 001B80A15G; 001B60H35B

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2/9/47 (Item 3 from file: 144)
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14068889 PASCAL No.: 99-0260812

Selective area growth by metal organic vapor phase epitaxy and atomic layer epitaxy using Ga SUB 2 O SUB 3 as a novel mask layer

HIROSE Shingo; YOSHIDA Akihiro; YAMAURA Masaaki; HARA Kazuhiko; MUNEKATA Hiro

vapor deposition; Temperature effect

French Descriptors: Electrolyte solide polymere; Caracteristique electrique
; Etude comparative; Epitaxie; Methode couche atomique; Accumulateur
electrochimique; Batterie; Zinc; Processus fabrication; Compose insertion
; Reaction reversible; Cycle charge decharge; Cathode; Titane oxyde;
Couche mince; Depot chimique phase vapeur; Effet temperature; TiO₂; O Ti

Classification Codes: 001D05I03E

2/9/51 (Item 7 from file: 144)
DIALOG(R)File 144:Pascal
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03966591 PASCAL No.: 75-0104514

**LASER FLUORESCENCE STUDY OF AL₂O₃ FORMED IN THE REACTION AL+O SUB 2 :
PRODUCT STATE DISTRIBUTION, DISSOCIATION ENERGY, AND RADIATIVE LIFETIME.**

DAGDIGIAN P J; CRUSE H W; ZARE R N

DEP. CHEM., COLUMBIA UNIV., NEW YORK, N.Y. 10027

Journal: J. CHEM. PHYS., 1975, 62 (5) 1824-1833

Availability: CNRS-127

No. of Refs.: 36 REF.

Document Type: P (SERIAL) ; A (ANALYTIC)

Country of Publication: USA

Language: ENGLISH

DETERMINATION DES POPULATIONS VIBRATIONNELLES RELATIVES ET DES
POPULATIONS ROTATIONNELLES RELATIVES POUR LES NIVEAUX V=0 ET V=1.
COMPARAISON DE CES DISTRIBUTIONS A CELLES CALCULEES PAR LA THEORIE DE
L'ESPACE DES PHASES. LA REPARTITION DE L'ENERGIE DE REACTION PARMI LES
MODES DE PRODUIT N'EST PAS REGIE PAR DES CONSIDERATIONS STATISTIQUES
SEULES. DETERMINATION DE LA LIMITE INFERIEURE D'ENERGIE ET DE DISSOCIATION
DE L'ETAT FONDAMENTAL. MESURE DU DECLIN DE FLUORESCENCE DE **ALD** (E SUP 2
SIGMA SUP +)

English Descriptors: ALUMINIUM COMPOUND; ALUMINIUM OXIDE ;
CHEMILUMINESCENCE; ATOM MOLECULE COLLISION; **REACTIVE** COLLISION;
REACTION ENERGY DISTRIBUTION; LIFETIME; ROVIBRONIC EXCITED STATE; LASER
BEAM; DIATOMIC MOLECULE; OXIDES; OXYGEN; INORGANIC FREE RADICAL;
LUMINESCENCE SPECTROMETRY

English Generic Descriptors: ATOMIC AND MOLECULAR PHYSICS

French Descriptors: ALUMINIUM; OXYGENE; MOLECULE DIATOMIQUE; COLLISION
ATOME MOLECULE; COLLISION REACTIVE; CHIMILUMINESCENCE; ETAT ROVIBRONIQUE
EXCITE; DISTRIBUTION ENERGIE REACTION; SPECTROMETRIE LUMINESCENCE;
FAISCEAU LASER; DUREE VIE; ALUMINIUM COMPOSE; OXYDE; RADICAL LIBRE
MINERAL; ALUMINIUM ATOME; OXYGENE MOLECULE; ALUMINIUM OXYDE

French Generic Descriptors: PHYSIQUE ATOMIQUE ET MOLECULAIRE

Classification Codes: 165A04C03

2/9/52 (Item 8 from file: 144)
DIALOG(R)File 144:Pascal
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03478892 PASCAL No.: 81-0519301

**STEREOCHEMICAL COURSE OF THE "MIXED HYDRIDE" (AID SUB 3 AND ALCL SUB 2
H) REDUCTION OF OPTICALLY ACTIVE STYRENE-2,2-D SUB 2 OXIDE**

ELSENBAUMER R L; MOSHER H S; MORRISON J D; TOMASZEWSKI J E

STANFORD UNIV., DEP. CHEM./STANFORD CA 94305, USA

Journal: J. ORG. CHEM., 1981, 46 (20) 4034-4038

ISSN: 0022-3263 Availability: CNRS-602

No. of Refs.: 29 REF.

Document Type: P (SERIAL) ; A (ANALYTIC)

Country of Publication: SA

Language: ENGLISH

LA REDUCTION DE (R) (+) STYRENE OXYDE-D SUB 2 -2,2 PAR ALD SUB 3 DANS L'ETHER DONNE UN MELANGE PRESQU'EGAL DE (S) (+) PHENYL-1 ETHANOL-D SUB 3 -2,2,2 ET DE (S) (-) PHENYL-2 ETHANOL-D SUB 3 -1,1,2, CE DERNIER ETANT FOURNI AVEC UNE INVERSION DE CONFIGURATION PRESQUE TOTALE A LA POSITION BENZYLIQUE. LE DEPLACEMENT-1,2 DE DEUTERIURE ACCOMPAGNANT LA REDUCTION PAR ALCL SUB 2 H A LIEU AVEC 62% D'INVERSION ET 38% DE RETENTION DE CONFIGURATION SUR LA POSITION BENZYLIQUE

English Descriptors: ALUMINIUM III DEUTERIDE-ENT; LABELLED COMPOUND; HYDROGEN ISOTOPE; DEUTERIUM; ALUMINIUM III HYDRIDE; ALUMINIUM III HALOGENIDE HYDRIDE; ALCOHOL; CHEMICAL REACTION; STEREOCHEMISTRY; OXYGEN HETEROCYCLE; CHEMICAL REDUCTION; BENZENIC COMPOUND; THREE MEMBERED RING; ENANTIOMER(+); EPOXIDE; CONFIGURATION INVERSION; REDUCTION
English Generic Descriptors: ORGANIC CHEMISTRY

French Descriptors: ALUMINIUM III DEUTERIURE-ENT; COMPOSE MARQUE; HYDROGENE ISOTOPE; DEUTERIUM; ALUMINIUM III HYDRURE; ALUMINIUM III HYDRUROHALOGENURE; ENANTIOMERE(+); ALCOOL; COMPOSE BENZENIQUE; INVERSION CONFIGURATION; REACTION CHIMIQUE; STEREOCHIMIE; HETEROCYCLE OXYGENE; CYCLE 3 CHAINONS; REDUCTION CHIMIQUE; EPOXYDE; OXIRANNE(PHENYL)-ENT; ETHANOL(PHENYL-1)-FIN; ETHANOL(PHENYL-2)-FIN; ALUMINIUM HYDRURODICHLORURE-ENT; ETHYLE ETHER-SUE
French Generic Descriptors: CHIMIE ORGANIQUE

Classification Codes: 173B04C

2/9/53 (Item 1 from file: 335)
DIALOG(R) File 335: Ceramic Abstracts
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07515802 DOCUMENT TYPE: JOURNAL ARTICLE

CSA ACCESSION NUMBER: 76-06068A

ROOM TEMPERATURE PEROVSKITE PRODUCTION FROM BIMETALLIC ALKOXIDES BY KETONE ASSISTED OXO SUPPLEMENTATION (KAOS)

AUTHOR: Gaskins B C; Lannutti J J
AUTHOR AFFILIATION: Ohio State University
JOURNAL: J. Mater. Res.

VOLUME/PAGE: 11, No. 8, 1996, p. 1953-1959

PUBLICATION YEAR: 1996

AVAILABLE FROM: CERAM Research

LANGUAGE: ENGLISH

ABSTRACT: BaTiO₃ was prepared at room temperature from a well-characterised crystalline barium titanium oxo alkoxide by reaction with acetone. An aldol condensation apparently supplies oxygen to condensing oxo alkoxide clusters. TEM confirmed that the crystallites so formed are dense and perfect with an average size of approximately 8.5 nm. Characterisation of reactants and products using DTA/TGA, XRD, FEM and ICP provides a tentative understanding of structural evolution and the intermediates of the transformation. Crystalline SrTiO₃ and BaZrO₃ were also formed at room temperature by this same method. 22 refs.

DESCRIPTORS: BARIUM TITANATE; STRONTIUM TITANATE; BARIUM ZIRCONATE; POWDERS; SOL-GEL PROCESS
SECTION: Raw Materials

Journal: Journal of Alloys and Compounds Conference Title: J. Alloys
Compd. (Switzerland) Vol.275-277 p.10-14

Publisher: Elsevier,

Publication Date: 24 July 1998 Country of Publication: Switzerland

CODEN: JALCEU ISSN: 0925-8388

SICI: 0925-8388(19980724)275/277L:10:DLST;1-3

Material Identity Number: 0876-98011

U.S. Copyright Clearance Center Code: 0925-8388/98/\$19.00

Conference Title: 3rd International Conference on f Elements (ICFE-3)

Conference Date: 14-19 Sept. 1997 Conference Location: Paris, France

Document Number: S0925-8388(98)00264-3

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Experimental (X)

Abstract: Lanthanum sulfide thin films prepared using **atomic layer epitaxy** technique were analysed by X-ray diffraction and X-ray photoelectron spectrometry. The films grown from a beta -diketonate precursor and H/sub 2/S were amorphous below 400 degrees C. The first traces of crystallization appeared above 400 degrees C, and at 500 degrees C films of well-defined cubic gamma -La/sub 2/S/sub 3/ structure could be deposited. XPS analysis revealed the presence of La/sub 2/S/sub 3/ both in amorphous and crystallized samples. Upon annealing at 510-730 degrees C the material **reacted** with residual **oxygen** in the bulk and La/sub 2/O/sub 2/S and other oxysulfides were formed. (20 Refs)

Subfile: A

Descriptors: amorphous state; annealing; **atomic layer epitaxial** growth; crystal microstructure; crystallisation; epitaxial layers; lanthanum compounds; X-ray photoelectron spectra

Identifiers: lanthanum sulfide; thin films; **atomic layer epitaxy**; X-ray diffraction; X-ray photoelectron spectrometry; diketonate precursor; amorphous films; crystallization; cubic structure; annealing; temperature dependence; lanthanum oxysulfide; growth rate; depth profiles; 300 to 730 C; La/sub 2/S/sub 3/; La/sub 2/O/sub 2/S

Class Codes: A8115G (Vacuum deposition); A6855 (Thin film growth, structure, and epitaxy); A6140 (Amorphous and polymeric materials); A6170A (Annealing processes); A8280P (Electron spectroscopy for chemical analysis (photoelectron, Auger spectroscopy, etc.)); A6470K (Solid-solid transitions); A7960E (Photoelectron spectra of semiconductors and insulators)

Chemical Indexing:

La2S3 bin - La2 bin - La bin - S3 bin - S bin (Elements - 2)

La2O2S ss - La2 ss - La ss - O2 ss - O ss - S ss (Elements - 3)

Numerical Indexing: temperature 5.73E+02 to 1.00E+03 K

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2/9/6 (Item 6 from file: 2)

DIALOG(R) File 2:INSPEC

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4882941 INSPEC Abstract Number: A9506-6855-020

Title: Surface coverage of ALE precursors on oxides

Author(s): Haukka, S.; Lakomaa, E.-L.; Suntola, T.

Author Affiliation: Microchemistry Ltd., Espoo, Finland

Journal: Applied Surface Science vol.82-83 p.548-52

Publication Date: Dec. 1994 Country of Publication: Netherlands

CODEN: ASUSEE ISSN: 0169-4332

U.S. Copyright Clearance Center Code: 0169-4332/94/\$07.00

Conference Title: Third International Symposium on Atomic Layer Epitaxy and Related Surface Processes. ALE-3

Conference Date: 25-27 May 1994 Conference Location: Sendai, Japan

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Experimental (X)

Abstract: The work with single molecular layers on porous materials adds to the atomic level understanding of the film growth in **ALE**. In this paper the primary factors affecting the surface coverage of three different **ALE** precursors (TiCl/sub 4/, Cr(acac)/sub 3/ and hexamethyldisilazane

(HMDS)) on porous, high surface area SiO₂/sub 2/ were studied by element determinations and FTIR spectroscopy. Also a preliminary low-energy ion scattering (LEIS) study on Ti/silica samples was carried out. First, the surface coverage of metal species achievable at a certain reaction temperature on an oxide is determined by the number of specific reactive sites for the precursor. TiCl₄/sub 4/ utilizes both isolated and H-bonded OH groups while Cr(acac)₃/sub 3/ and HMDS react preferentially with isolated OH groups. Second, the bonding mode affected the surface coverage of titanium species. The bifunctional reactivity of TiCl₄/sub 4/, on the one hand, consumed two OH groups per one TiCl₄/sub 4/ molecule lowering the surface coverage on silica preheated at elevated temperatures, and on the other hand, enabled the utilization of the H-bonded OH groups present on silica preheated at lower temperatures thereby increasing the surface coverage. Third, the steric hindrance between the precursor and the already chemisorbed metal complexes was shown to have an effect on the surface coverage of Cr(acac)₃/sub 3/ because of the size of two remaining acac ligands of bound chromium complex. Hence, at saturating reaction conditions of compound precursors, where undecomposed, reproducible and selectively chemisorbed surface species are obtained, the full monolayer coverage on oxides is seldom achieved. (15 Refs)

Subfile: A

Descriptors: **atomic layer epitaxial growth**; bonds (chemical); chemisorption; Fourier transform spectra; infrared spectra; ion-surface impact; porous materials; silicon compounds; titanium

Identifiers: surface coverage; **ALE** precursors; oxides; single molecular layers; porous materials; film growth; Cr(acac)₃/sub 3/; hexamethyldisilazane; high surface area SiO₂/sub 2/; element determinations; FTIR spectroscopy; low-energy ion scattering; Ti/silica samples; reaction temperature; OH groups; bonding mode; bifunctional reactivity; silica; steric hindrance; chemisorbed metal complexes; bound chromium complex; saturating reaction conditions; SiO₂/sub 2/; TiCl₄/sub 4/; Ti-SiO₂/sub 2

Class Codes: A6855 (Thin film growth, structure, and epitaxy); A8115H (Chemical vapour deposition); A7830 (Infrared and Raman spectra and scattering (condensed matter)); A7920N (Atom-, molecule-, and ion-surface impact); A6845D (Evaporation and condensation; interface adsorption and desorption kinetics)

Chemical Indexing:

SiO₂ sur - O₂ sur - Si sur - O sur - SiO₂ bin - O₂ bin - Si bin - O bin (Elements - 2)

TiCl₄ bin - Cl₄ bin - Cl bin - Ti bin (Elements - 2)

Ti-SiO₂ int - SiO₂ int - O₂ int - Si int - Ti int - O int - SiO₂ bin - O₂ bin - Si bin - O bin - Ti el (Elements - 1,2,3)

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2/9/7 (Item 7 from file: 2)

DIALOG(R) File 2:INSPEC

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4578632 INSPEC Abstract Number: A9404-7755-013, B9402-0510D-159

Title: Electrical properties of tantalum based composite oxide films

Author(s): Kattelus, H.; Ylilammi, M.; Salmi, J.; Ranta-Aho, T.; Wykanen, E.; Suni, I.

Author Affiliation: VTT Semicond. Lab., Espoo, Finland

Conference Title: Amorphous Insulating Thin Films Symposium p.511-16

Editor(s): Kanicki, J.; Warren, W.L.; Devine, R.A.B.; Matsumura, M.

Publisher: Mater. Res Soc, Pittsburgh, PA, USA

Publication Date: 1993 Country of Publication: USA xii+636 pp.

Conference Date: 1-4 Dec. 1992 Conference Location: Boston, MA, USA

Language: English Document Type: Conference Paper (PA)

Treatment: Experimental (X)

Abstract: Tantalum oxide is a widely used insulator in electronic applications requiring high permittivity. When deposited at low temperature, tantalum oxide films, however, often exhibit large leakage current. A common way to reduce leakage is to anneal the films in an ambient containing extremely **reactive oxygen** species, or at high temperature in dry oxygen. A different approach is to use composite oxide

materials. We have studied layered tantalum based oxides deposited by Atomic Layer Epitaxy, and observed that the leakage current is decreased by several orders of magnitude when a fraction of tantalum oxide is replaced by another oxide, such as aluminum or hafnium oxide. Leakage current density of 40 nA/cm² in the electric field of 1 MV/cm is attained for unannealed Ta-Hf-O film deposited at 300 degrees C. Layered composite insulators are an interesting new class of materials, and ALE proves to be a useful method for depositing them. (9 Refs)

Subfile: A B

Descriptors: atomic layer epitaxial growth; hafnium compounds; insulating thin films; permittivity; tantalum compounds

Identifiers: ECITF; composite oxide films; high permittivity; large leakage current; Atomic Layer Epitaxy; 300 degC; unannealed Ta-Hf-O film

Class Codes: A7755 (Dielectric thin films); A8115G (Vacuum deposition); A6855 (Thin film growth, structure, and epitaxy); A7360H (Insulating thin films); B0510D (Epitaxial growth); B2830E (Inorganic insulation)

Chemical Indexing:

TaHfO ss - Hf ss - Ta ss - O ss (Elements - 3)*

Numerical Indexing: temperature 5.73E+02 K

2/9/8 (Item 8 from file: 2)

DIALOG(R)File 2:INSPEC

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03723836 INSPEC Abstract Number: A90133796

Title: Surface reaction in alpha -Al/sub 2/O/sub 3/ layer growth

Author(s): Oya, G.; Sawada, Y.

Author Affiliation: Dept. of Electr. & Electron. Eng., Utsunomiya Univ., Japan

Journal: Acta Polytechnica Scandinavica, Chemical Technology and Metallurgy Series no. Ch195 p.185-92

Publication Date: 1990 Country of Publication: Finland

CODEN: APSSEH ISSN: 0781-2698

Conference Title: 1st International Symposium on Atomic Layer Epitaxy

Conference Date: 11-13 June 1990 Conference Location: Espoo, Finland

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Experimental (X)

Abstract: Single-crystal alpha -Al/sub 2/O/sub 3/ films are grown epitaxially on hot single-crystal alpha -Al/sub 2/O/sub 3/ wafers by a molecular layer epitaxy (MLE) method using a AlCl/sub 3/ vapor and a He15%O/sub 2/ gas mixture. The dependences of the growth rates of the alpha -Al/sub 2/O/sub 3/ films on the pressure of the transported AlCl/sub 3/ vapor and on the substrate temperature are studied. And the mechanism of MLE of the alpha -Al/sub 2/O/sub 3/ films is studied by using a quadrupole mass spectrometer. It is found that the dissociation of the transported AlCl/sub 3/ vapor and the chemisorption of dissociated AlCl or/and AlCl/sub 2/ molecules on the hot substrates, where the chemisorbed molecules react subsequently with transported oxygen molecules, play essential roles for layer growth of the alpha -Al/sub 2/O/sub 3/ films in MLE. (10 Refs)

dup

Subfile: A

Descriptors: alumina; atomic layer epitaxial growth; ceramics; chemisorption

Identifiers: surface reaction; molecular layer epitaxy; growth rates; substrate temperature; quadrupole mass spectrometer; chemisorption; AlCl/sub 3/ vapor; AlCl/sub 2/; alpha Al/sub 2/O/sub 3/ single crystal films; Al/sub 2/O/sub 3/ wafers; He-O/sub 2/

Class Codes: A8115G (Vacuum deposition); A6845 (Solid-fluid interface processes); A6855 (Thin film growth, structure, and epitaxy); A8265M (Sorption and accommodation coefficients)

Chemical Indexing:

Al2O3 int - Al2 int - O3 int - O int - Al2O3 bin - Al2 bin - Al bin - O3 bin - O bin (Elements - 2)

Al2O3 sur - Al2 sur - Al sur - O3 sur - O sur - Al2O3 bin - Al2 bin - Al bin - O3 bin - O bin (Elements - 2)

452 (Sewage & Industrial Wastes Treatment); 802 (Chemical Apparatus & Plants); 804 (Chemical Products)
45 (POLLUTION & SANITARY ENGINEERING); 80 (CHEMICAL ENGINEERING)

2/9/22 (Item 14 from file: 8)
DIALOG(R) File 8: Ei Compendex(R)
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03035163 E.I. Monthly No: EIM9103-009079

Title: Surface reaction in alpha -Al//20//3 layer growth.

Author: Oya, Gin-ichiro; Sawada, Yasuji

Corporate Source: Utsunomiya Univ, Utsunomiya, Jpn

Conference Title: First International Symposium on Atomic Layer Epitaxy

Conference Location: Espoo, Finl **Conference Date:** 19900611

E.I. Conference No.: 13722

Source: Acta Polytechnica Scandinavica, Chemical Technology and Metallurgy Series n 195 1990. Publ by Finnish Acad of Technology, Helsinki, Finl. p 185-192

Publication Year: 1990

CODEN: APSSEH **ISSN:** 0781-2698

Language: English

Document Type: JA; (Journal Article) **Treatment:** X; (Experimental)

Journal Announcement: 9103

Abstract: Single-crystal alpha -Al//20//3 films are grown epitaxially on hot single-crystal alpha -Al//20//3 wafers by a molecular layer epitaxy (MLE) method using a AlCl//3 vapor and a He15%O//2 gas mixture. The dependences of the growth rates of the alpha -Al//20//3 films on the pressure of the transported AlCl//3 vapor and on the substrate temperature are studied. And the mechanism of MLE of the alpha -Al//20//3 films is studied by using a quadrupole mass spectrometer. It is found that the dissociation of the transported AlCl//3 vapor and the chemisorption of dissociated AlCl or/and AlCl//2 molecules on the hot substrates, where the chemisorbed molecules react subsequently with transported oxygen molecules, play essential roles for layer growth of the alpha -Al//20//3 films in MLE. (Author abstract) 10 Refs.

Descriptors: *ALUMINA--*Surfaces; CRYSTALS--Epitaxial Growth

Identifiers: ATOMIC LAYER EPITAXY ; ALUMINA LAYER EPITAXY; FILM GROWTH RATE; DISSOCIATION

Classification Codes:

812 (Ceramics & Refractories); 801 (Chemical Analysis & Physical Chemistry); 531 (Metallurgy & Metallography)

81 (CHEMICAL PROCESS INDUSTRIES); 80 (CHEMICAL ENGINEERING); 53 (METALLURGICAL ENGINEERING)

2/9/23 (Item 15 from file: 8)
DIALOG(R) File 8: Ei Compendex(R)
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02766896 E.I. Monthly No: EI8908069032

Title: Anaerobic digestion of brewery wastewater using a fixed-film reactor.

Author: Lo, K. V.; Liao, P. H.

Corporate Source: Univ of British Columbia, Vancouver, BC, Can

Source: Canadian Agricultural Engineering v 31 n 1 Jan 1989 p 61-63

Publication Year: 1989

CODEN: CAEQAI **ISSN:** 0045-432X

Language: English

Document Type: JA; (Journal Article) **Treatment:** X; (Experimental)

Journal Announcement: 8908

Abstract: A laboratory-scale anaerobic fixed-film reactor receiving brewery wastewater was studied over a range of hydraulic retention times at 35 degree C. Ale yeast wastewater could be successfully digested in a fixed-film reactor, with methane production of 1.18-1.43 liter methane per liter of reactor volume per day and 70-82% reduction in chemical oxygen demand. The fixed-film reactor performed well at hydraulic retention

05476571 E.I. No: EIP25024326

Title: Atomic layer deposition of Ta//20//5 films using Ta(OC//2H//5)//5 and NH//3

Author: Song, Hyun-Jung; Koh, Wonyong; Kang, Sang-Wong

Corporate Source: Korea Advanced Inst of Science and Technology, Taejon, S Korea

Conference Title: Proceedings of the 1999 MRS Spring Meeting - Symposium on Ultrathin SiO2 and High-k Materials for ULSI Gate Dielectrics

Conference Location: San Francisco, CA, USA Conference Date: 19990405-19990408

Sponsor: Hitachi, Ltd.; Mitsubishi Electric Corporation; NEC Corporation; Texas Instruments; et al.

E.I. Conference No.: 55914

Source: Materials Research Society Symposium - Proceedings v 567 1999. p 469-471

Publication Year: 1999

CODEN: MRSPDH ISSN: 0272-9172

Language: English

Document Type: JA; (Journal Article) Treatment: X; (Experimental)

Journal Announcement: 0003W4

Abstract: Tantalum oxide films were grown by chemical vapor deposition using an alternating supply of tantalum pentaethoxide and ammonia. The supply of one source was followed by a purge with argon gas before introducing the other source onto the substrate in order to prevent gas-phase reactions. At substrate temperature between 250-275 degree C the film growth depended only on the number of source supply cycles (0.15 nm cycle) and did not depend on the substrate temperature nor supply time of the sources. As-deposited films were amorphous, however, were crystallized after annealing at 800 degree C in oxygen atmosphere by rapid thermal process. Annealed films showed increased dielectric constant and decreased leakage current density, which were 13.3 and 6.6 $\mu\text{A}/\text{cm}^2$ at 1 MV/cm, respectively, for a 15-nm-thick film after annealing at 800 degree C for 10 minutes. (Author abstract) 5 Refs.

Descriptors: *Dielectric films; Tantalum compounds; Ammonia; Chemical vapor deposition; Film growth; Amorphous films; Crystallization; Substrates; Thermal effects; Rapid thermal annealing

Identifiers: Atomic layer deposition; Tantalum oxide; Tantalum pentaethoxide; Gas phase reaction

Classification Codes:

933.1.2 (Crystal Growth)

708.1 (Dielectric Materials); 804.2 (Inorganic Components); 802.2 (Chemical Reactions); 933.2 (Amorphous Solids); 933.1 (Crystalline Solids); 641.1 (Thermodynamics)

708 (Electric & Magnetic Materials); 804 (Chemical Products); 802 (Chemical Apparatus & Plants); 933 (Solid State Physics); 641 (Heat & Thermodynamics)

70 (ELECTRICAL ENGINEERING); 80 (CHEMICAL ENGINEERING); 93 (ENGINEERING PHYSICS); 64 (HEAT & THERMODYNAMICS)

2/9/14 (Item 6 from file: 8)

DIALOG(R) File 8: Ei Compendex(R)

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05341795 E.I. No: EIP99084757436

Title: Selective area growth by metal organic vapor phase epitaxy and atomic layer epitaxy using Ga//20//3 as a novel mask layer

Author: Hirose, Shingo; Yoshida, Akihiro; Yamaura, Masaaki; Hara, Kazuhiko; Munekata, Hiro

Corporate Source: Mechanical Engineering Lab, Ibaraki, Jpn

Source: Japanese Journal of Applied Physics, Part 1: Regular Papers and Short Notes and Review Papers v 38 n 3 A 1999. p 1516-1520

Publication Year: 1999

CODEN: JAPNDE ISSN: 0021-4922

Language: English

Document Type: JA; (Journal Article) Treatment: T; (Theoretical)

Journal Announcement: 9910W1

Abstract: A novel technique is proposed for advanced microstructure formation using Ga₂O₃ as a new mask material. Ga₂O₃ layers were prepared by RF sputtering with Ga₂O₃ powder target and patterned using photolithography. Scanning electron microscope (SEM) and Photoluminescence (PL) measurement findings indicate that reasonably high-quality single crystalline GaAs layers could be successfully grown selectively on the unmasked region by metal organic vapor phase epitaxy (MOVPE) and atomic layer epitaxy (ALE). The GaAs/AlGaAs quantum structure was also fabricated by selective area MOVPE, however, at this stage, polycrystalline AlGaAs layers formed on the mask region after the mask removal and the regrowth of AlGaAs overlayers. The key factor in this microstructure fabrication process is the sensitive dependence of Ga oxide layers against the reactor pressure under H₂ exposure. (Author abstract) 16 Refs.

Descriptors: *Semiconductor growth; Metallorganic vapor phase epitaxy; Masks; Semiconducting gallium arsenide; Crystal microstructure; Sputtering; Photolithography; Scanning electron microscopy; Photoluminescence; Single crystals

Identifiers: Gallium oxide; Atomic layer epitaxy; Selective area growth

Classification Codes:

933.1.2 (Crystal Growth); 712.1.2 (Compound Semiconducting Materials); 933.1.1 (Crystal Lattice)
712.1 (Semiconducting Materials); 933.1 (Crystalline Solids); 714.2 (Semiconductor Devices & Integrated Circuits); 741.1 (Light/Optics)
712 (Electronic & Thermionic Materials); 933 (Solid State Physics); 714 (Electronic Components); 741 (Optics & Optical Devices)
71 (ELECTRONICS & COMMUNICATIONS); 93 (ENGINEERING PHYSICS); 74 (OPTICAL TECHNOLOGY)

2/9/15 (Item 7 from file: 8)

DIALOG(R) File 8: Ei Compendex(R)

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05142310 E.I. No: EIP98104423752

Title: Development of metal oxide multilayer reflectors for water-window wavelengths by atomic layer deposition

Author: Matsuyama, H.; Kumagai, H.; Iimura, Y.; Midorikawa, K.; Obara, M.

Corporate Source: Inst of Physical and Chemical Research (RIKEN), Saitama, Jpn

Conference Title: Proceedings of the 1998 International Symposium on Information Theory, CLEO/EUROPE'98

Conference Location: Glasgow, Scotland Conference Date: 19980914-19980918

E.I. Conference No.: 49092

Source: Conference on Lasers and Electro-Optics Europe - Technical Digest 1998. IEEE; Piscataway, NJ, USA. p 254 CThC3

Publication Year: 1998

CODEN: 85PNA9

Language: English

Document Type: CA; (Conference Article) Treatment: T; (Theoretical); X; (Experimental)

Journal Announcement: 9812W3

Abstract: Novel metal oxide multilayers with amorphous titanium oxide and aluminum oxide fabricated by atomic layer deposition technique have been developed. This technique makes it possible to control the film thickness on a atomic scale due to self-limiting adsorption mechanism in surface chemical reactions. The details of the superlattice oxide multilayers are presented and discussed. 1 Refs.

Descriptors: *Mirrors; Multilayers; Oxides; Deposition; X ray microscopes; Light reflection; Surface roughness; Interfaces (materials); Calculations; Atomic force microscopy

Identifiers: Atomic layer deposition; Root mean square deviation

Classification Codes:

741.3 (Optical Devices & Systems); 804.2 (Inorganic Components); 802.3 (Chemical Operations); 741.1 (Light/Optics); 931.2 (Physical Properties)

Title: Photo atomic layer deposition of transparent conductive ZnO films

Author: Saito, Koki; Watanabe, Yuki; Takahashi, Kiyoshi; Matsuzawa, Takeo ; Sang, Baosheng; Konagai, Makoto
Corporate Source: Teikyo Univ of Science and Technology, Yamanashi, Jpn
Source: Solar Energy Materials and Solar Cells v 49 n 1-4 Dec 1997. p 187-193

Publication Year: 1997

CODEN: SEMCEQ **ISSN:** 0927-0248

Language: English

Document Type: JA; (Journal Article) **Treatment:** X; (Experimental)

Journal Announcement: 9802W3

Abstract: Low-resistivity ZnO films were grown by photo atomic layer deposition (photo-ALD) technique using diethylzinc (DEZ) and H₂O as reactant gases. Self-limiting growth was achieved for the temperature range from 105 degree C to 235 degree C. It was found that UV light irradiation was very effective to increase the electron concentration of the films and the electron concentration of 5 multiplied by 10²⁰ cm⁻³ was achieved even in undoped ZnO. Thus, the resistivity of the films grown with UV irradiation was one order of magnitude less than that grown without UV irradiation. The minimum resistivity of 6.9 multiplied by 10⁻⁴ Omega cm was obtained by photo-ALD method without any intentional doping. (Author abstract) 5 Refs.

Descriptors: Conductive films; Zinc oxide ; Photochemical reactions ; Deposition; Electric conductivity; Film growth; Ultraviolet radiation; Electronic density of states; Doping (additives); Electric conductivity measurement

Identifiers: Photo atomic layer deposition ; Electron concentration; Transparent conductive oxide

Classification Codes:

933.1.2 (Crystal Growth)

708.2 (Conducting Materials); 804.2 (Inorganic Components); 741.1 (Light/Optics); 802.2 (Chemical Reactions); 701.1 (Electricity: Basic Concepts & Phenomena); 933.1 (Crystalline Solids)

708 (Electric & Magnetic Materials); 804 (Chemical Products); 741 (Optics & Optical Devices); 802 (Chemical Apparatus & Plants); 701 (Electricity & Magnetism); 933 (Solid State Physics)

70 (ELECTRICAL ENGINEERING); 80 (CHEMICAL ENGINEERING); 74 (OPTICAL TECHNOLOGY); 93 (ENGINEERING PHYSICS)

2/9/18 (Item 10 from file: 8)

DIALOG(R)File 8: Ei Compendex(R)

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04669280 E.I. No: EIP97043616470

Title: ALE-reactor for large area depositions

Author: Skarp, Jarmo I.; Soininen, Pekka J.; Soininen, Pekka T.

Corporate Source: Microchemistry Ltd, Espoo, Finl

Conference Title: Proceedings of the 1996 4th International Symposium on Atomic Layer Epitaxy and Related Surface Processes, ALE-4

Conference Location: Linz, Austria **Conference Date:** 19960729-19960731

E.I. Conference No.: 46245

Source: Applied Surface Science v 112 Mar 2 1997. p 251-254

Publication Year: 1997

CODEN: ASUSEE **ISSN:** 0169-4332

Language: English

Document Type: JA; (Journal Article) **Treatment:** X; (Experimental)

Journal Announcement: 9706W1

Abstract: An atomic layer epitaxy (ALE) reactor has been constructed for R & D purposes. This piece of equipment can handle up to 30 multiplied by 40 cm² rectangular plates or 300 mm wafers as substrates. The basic functions of the reactor are described. ZnO and Al₂O₃ were used as test processes. Thickness variation of less than 2% has been obtained in both cases. (Author abstract) 3 Refs.

Descriptors: Epitaxial growth; Chemical reactors ; Deposition; Silicon wafers; Substrates; Zinc oxide ; Alumina; Thin films; Inorganic coatings;

Glass

Identifiers: **Atomic layer epitaxy** ; Large area depositions

Classification Codes:

933.1.2 (Crystal Growth)

802.3 (Chemical Operations); 933.1 (Crystalline Solids); 802.1 (Chemical Plants & Equipment); 714.2 (Semiconductor Devices & Integrated Circuits); 804.2 (Inorganic Components); 813.2 (Coating Materials)
802 (Chemical Apparatus & Plants); 933 (Solid State Physics); 714 (Electronic Components); 804 (Chemical Products); 813 (Coatings & Finishes)

80 (CHEMICAL ENGINEERING); 93 (ENGINEERING PHYSICS); 71 (ELECTRONICS & COMMUNICATIONS); 81 (CHEMICAL PROCESS INDUSTRIES)

2/9/19 (Item 11 from file: 8)

DIALOG(R)File 8:EI Compendex(R)

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04569842 E.I. No: EIP96123430126

Title: Self-limiting growth of transparent conductive ZnO films by atomic layer deposition

Author: Sang, Baosheng; Konagai, Makoto

Corporate Source: Tokyo Inst of Technology, Tokyo, Jpn

Conference Title: Proceedings of the 1996 25th IEEE Photovoltaic Specialists Conference

Conference Location: Washington, DC, USA Conference Date: 19960513-19960517

Sponsor: IEEE

E.I. Conference No.: 45686

Source: Conference Record of the IEEE Photovoltaic Specialists Conference 1996. IEEE, Piscataway, NJ, USA, 96CH3589-7. p 1085-1088

Publication Year: 1996

CODEN: CRCNDP ISSN: 0160-8371

Language: English

Document Type: CA; (Conference Article) Treatment: A; (Applications); X; (Experimental)

Journal Announcement: 9701W4

Abstract: ZnO films have been grown by **atomic layer deposition (ALD)** using diethylzinc (DEZn) and H₂O as reactant gases. Self-limiting growth was observed for substrate temperatures from 105 to 165 degree C, even when the flow rates of DEZn and H₂O were varied. The film thickness was very uniform, which was greatly improved compared to films grown by MOCVD. The orientation of ZnO films depends strongly on the substrate temperature. A high electron mobility of 30 cm²/V center dot s is obtained for undoped 220 nm thick ZnO films, which is higher than that of films grown by MOCVD. (Author abstract) 4 Refs.

Descriptors: *Semiconducting films; Zinc oxide; Film growth; Water; Gases; Metallorganic chemical vapor deposition; Electric properties; Semiconducting glass; Substrates

Identifiers: **Atomic layer deposition** ; Carrier gas; Diethylzinc; **Reactant** gases; Substrate temperature; Transparent conductive **oxide**

Classification Codes:

712.1.2 (Compound Semiconducting Materials)

712.1 (Semiconducting Materials); 804.2 (Inorganic Components); 931.2 (Physical Properties of Gases, Liquids & Solids); 802.2 (Chemical Reactions)

712 (Electronic & Thermionic Materials); 804 (Chemical Products); 931 (Applied Physics); 802 (Chemical Apparatus & Plants)

71 (ELECTRONICS & COMMUNICATIONS); 80 (CHEMICAL ENGINEERING); 93 (ENGINEERING PHYSICS)

2/9/20 (Item 12 from file: 8)

DIALOG(R)File 8:EI Compendex(R)

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04046303 E.I. No: EIP95012529032

Title: Deposition and etching of tantalum oxide films atomic layer epitaxy process

Author: Aarik, Jaan; Aidla, Aleks; Kukli, Kaupo; Uustare, Teet

Corporate Source: Univ of Tartu, Tartu, Estonia

Source: Journal of Crystal Growth 144 1-2 Nov 1994. p 116-119

Publication Year: 1994

CODEN: JCRGAE **ISSN:** 0022-0248

Language: English

Document Type: JA; (Journal Article) **Treatment:** X; (Experimental)

Journal Announcement: 9503W4

Abstract: Effects of the reactor temperature and TaCl₅ precursor dose on the **atomic layer epitaxy (ALE)** growth of tantalum oxide films are studied. It is shown that etching takes place instead of growth when high TaCl₅ doses are used. The etching rate is enhanced by increase of the reactor temperature. In the case of optimum precursor doses, a growth rate equal to 0.06 nm per cycle was obtained at 300 degree C growth temperature. (Author abstract) 7 Refs.

Descriptors: *Film growth; Deposition; Etching; Thermal effects; Chemical reactors; Oxides; Glass; Crystal orientation; Crystals; Refractive index

Identifiers: Tantalum oxide film; **Atomic layer epitaxy**; **Reactor** temperature; Etching rate; Optimum precursor doses; Carrier gas

Classification Codes:

933.1.2 (Crystal Growth)

933.1 (Crystalline Solids); 813.1 (Coating Techniques); 801.4 (Physical Chemistry); 641.1 (Thermodynamics); 802.1 (Chemical Plants & Equipment); 804.2 (Inorganic Components)

933 (Solid State Physics); 813 (Coatings & Finishes); 801 (Chemical Analysis & Physical Chemistry); 641 (Heat & Thermodynamics); 802 (Chemical Apparatus & Plants); 804 (Chemical Products)

93 (ENGINEERING PHYSICS); 81 (CHEMICAL PROCESS INDUSTRIES); 80 (CHEMICAL ENGINEERING); 64 (HEAT & THERMODYNAMICS)

2/9/21 (Item 13 from file: 8)

DIALOG(R) File 8: Ei Compendex(R)

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03997506 E.I. No: EIP94122452716

Title: Anaerobic digestion of malt whisky distillery pot ale using upflow anaerobic sludge blanket reactors

Author: Goodwin, J.A.S.; Stuart, J.B.

Corporate Source: Heriot-Watt Univ, Edinburgh, Scotl

Source: Bioresource Technology: Biomass, Bioenergy, Biowastes, Conversion Technologies, Biotransformations, Production Technologies v 49 n 1 1994. p 75-81

Publication Year: 1994

CODEN: BIRTEB **ISSN:** 0960-8524

Language: English

Document Type: JA; (Journal Article) **Treatment:** X; (Experimental)

Journal Announcement: 9501W3

Abstract: The anaerobic treatment of pot ale, a liquid waste-product from the malt whisky industry, was investigated at laboratory scale using UASB (upflow anaerobic sludge blanket) reactors. Chemical oxygen demand reductions of around 90% were achieved after dilution, pH adjustment and settlement of the pot ale. Large amounts of ammonia were produced during treatment and the pH of the waste rose significantly. The maximum space loading rate consistent with stable operation was around 15 kg COD/m³ per day at a retention time of 2.1 days; higher loading rates produced process instability and failure. Extensive sludge granulation was observed during periods of stable operation. (Author abstract) 16 Refs.

Descriptors: Sludge digestion; Chemical reactors; Chemical oxygen demand; pH; Ammonia; Industrial waste treatment

Identifiers: Malt whiskey; Anaerobic digestion; Pot ale; Dilution; Sludge granulation

Classification Codes:

452.4 (Industrial Wastes Treatment); 802.1 (Chemical Plants & Equipment); 804.2 (Inorganic Components)

The major VOC in the breath of healthy individuals are 1-butene (12–580 ppb), acetone (1.2–1800 ppb), ethanol (13–1000 ppb), methanol (16–2000 ppb), and other alcohols. Human emissions of VOC are negligible on a regional (less than 4%) and global scale (less than 0.3%). However, in indoor air, under fairly crowded situations, human emissions of VOC may dominate other sources of VOC.

An important class of VOC in the atmosphere is alkenes, due to their high reactivity. The ozone reaction with alkenes forms OH radicals, a powerful oxidizing agent in the troposphere. OH radical formation yields from the ozonolysis of several cycloalkenes were measured using small amounts of fast-reacting aromatics and aliphatic ethers to trace OH formation. The values are 0.62 ± 0.15, 0.54 ± 0.13, 0.36 ± 0.08, and 0.91 ± 0.20 for cyclopentene, cyclohexene, cycloheptene and 1-methylcyclohexene, respectively. Density functional theory calculations at the B3LYP/6-31 G(d,p) level are presented to aid in understanding the trends observed.

The pressure dependence of OH radical yields may lend insight into the formation mechanism. We have made the first study of the pressure dependence of the OH radical yield for ethene, propene, 1-butene, *trans*-2-butene, and 2,3-dimethyl-2-butene over the range 20–760 Torr, and *trans*-3-hexene, and cyclopentene over the range 200–760 Torr. The OH yields from ozonolysis of ethene and propene were pressure dependent, while the other compounds had OH yields that were independent of pressure.

Ozone-alkene reactions form vibrationally excited carbonyl oxide intermediates (of the form R_1R_2COO), some of which, once thermalized, are thought to react with SO_2 , H_2O , NO_x , aldehydes and alcohols. Several studies using relative rate techniques and *ab initio* calculations have resulted in estimates for the rate coefficients of reactions of the thermalized biradicals. The ranges of measured and estimated rate coefficients span two to six orders of magnitude, depending on the reaction partner. Using an atmospheric pressure flow reactor, we have made the first absolute rate coefficient determination for the decomposition of and reaction with acetaldehyde of thermalized CH_3CHOO from *trans*-2-butene ozonolysis. The measurement results are: $k_{dec} = 76 \text{ s}^{-1}$ and $k_{ald} = 1.0 \times 10^{-12} \text{ cm}^3 \text{ molec}^{-1} \text{ s}^{-1}$.

2/9/37 (Item 3 from file: 35)

DIALOG(R) File 35:Dissertation Abs Online

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01688065 ORDER NO: NOT AVAILABLE FROM UNIVERSITY MICROFILMS INT'L.
**STUDIES ON PRECURSORS AND THEIR APPLICATION IN THE ATOMIC LAYER
EPITAXY GROWTH OF THIN FILMS FOR ELECTROLUMINESCENT DEVICES (LANTHANIDE,
ALUMINIUM OXIDE)**

Author: TIITTA, MARJA KAARINA

Degree: DR.

Year: 1998

Corporate Source/Institution: TEKNILLINEN KORKEAKOULU (HELSINKI)
(FINLAND) (5766)

Source: VOLUME 60/02-C OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 461. 51 PAGES

Descriptors: ENGINEERING, CHEMICAL

Descriptor Codes: 0542

ISBN: 951-22-4269-9

Publisher: TKK OFFSET, LIBELLA PAINOPALVELU, TEKNIKANTIE 3, FIN-02150
ESPOO, FINLAND

Alkaline earth metal sulfides, doped with various activators, can be used as phosphor layers in electroluminescent (EL) structures. As potential precursor compounds for dopant and matrix elements, the thermal properties and gas phase compositions of rare earth, alkali metal and alkaline earth metal β -diketonate chelates were analysed by thermogravimetry,

differential scanning calorimetry and mass spectrometry. the rare earth (Y, La, Ce, Pr, Sm, Eu, Gd, Tb, Tm, Yb) and alkali metal (Na, K) 2,2,6,6-tetramethyl-3,5-heptanedionates (thd), 1,1,1-trifluoro-2,4-pentanedionates (tfa) and 1,1,1,6,6,6-hexafluoro-2,4-pentanedionates (hfa) sublimed at temperatures under 573 K at atmospheric pressure, whereas the alkaline earth metal (Ca, Sr, Ba) thd compounds mostly sublimed between 573 and 673 K. Thermal decomposition of the thd compounds during sublimation was slight: sublimation residues were under 7 wt-%. The residues of tfa and hfa complexes were at maximum 17 wt-% ($\text{Pr(hfa)}_3 \cdot 3\text{H}_2\text{SO}_4$). Several of the complexes have already been successfully utilised in the growth of phosphor layers.

Oligomeric species were detected in gas phase mass spectra of the alkali and alkaline earth metal thd complexes suggesting the complicated adsorption in the thin film growth. In corresponding compounds of the trivalent rare earth thd chelates one or two thd ligands were bonded with the central atom. In the case of tetravalent lanthanide chelates, the main peaks were for species where three ligands were bonded with the central atom. The adduct ligands water and dimethylformamide were present in the gas phase together with the complex structures.

Aluminium oxide thin films are used in EL structures as ion barrier, passivation and dielectric layers. In this work, aluminium alkoxides and aluminium chloride were used as aluminium source, and water, various alcohols and oxygen as oxygen source in the Atomic Layer Epitaxy (ALE). The aluminium oxide films were sometimes also doped with phosphorus. The growth rates of aluminium oxide thin films grown from alkoxides and chloride were 1.0-1.4 Å/cycle and 0.45-0.7 Å/cycle, respectively. The growth rates decreased with increasing temperature in the range 623-723 K (aluminium alkoxides) and 573-773 K (aluminium chloride). The growth rates increased with doping density of phosphorus, from 0.5 Å/cycle (no doping) to 1.3 Å/cycle (5:1, water as oxygen source). The sizes of surface species formed through the surface reaction of aluminium and oxygen sources and the degree of dehydroxylation of the surface determined the growth rate in the ALE process.

The aluminium oxide films grown from AlCl_3 contained chlorine, the content of which decreased with increasing temperature. No carbon was detected in the films when the growth temperatures were above 673 K. Some OH-residue were present in all films though its chemical environment differed as judged from the FTIR spectra. The surfaces of the films were smooth and non-porous. The breakdown voltages exceeded 3×10^6 V/cm and dielectric constants were about 8.

2/9/38 (Item 4 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online
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01685635 ORDER NO: AADNQ-35303

THERAPEUTIC MECHANISMS OF PROPYLTHIOURACIL IN THE TREATMENT OF ALCOHOLIC LIVER DISEASE

Author: ROSS, ARON DAVID

Degree: PH.D.

Year: 1998

Corporate Source/Institution: UNIVERSITY OF TORONTO (CANADA) (0779)

Adviser: YEDY ISRAEL

Source: VOLUME 60/01-B OF DISSERTATION ABSTRACTS INTERNATIONAL.

PAGE 143. 215 PAGES

Descriptors: HEALTH SCIENCES, PHARMACOLOGY ; BIOLOGY, MOLECULAR ; HEALTH SCIENCES, MEDICINE AND SURGERY

Descriptor Codes: 0419; 0307; 0564

ISBN: 0-612-35303-6

Alcoholic liver disease (ALD) is a common and serious disorder that responds poorly to treatment with conventional pharmacological therapies. The antithyroid drug propylthiouracil (PTU) has been shown to ameliorate ALD in both rodents and humans, however the mechanism of action has not been clearly defined. The present studies examined several possible

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Journal: Japanese Journal of Applied Physics, Part I : Regular papers, short notes & review papers, 1999-03, 38 (3A) 1516-1520

ISSN: 0021-4922 CODEN: JAPNDE Availability: INIST-9959

Document Type: P (Serial) ; A (Analytic)

Country of Publication: United States

Language: English

A novel technique is proposed for advanced microstructure formation using Ga SUB 2 O SUB 3 as a new mask material. Ga SUB 2 O SUB 3 layers were prepared by RF sputtering with Ga SUB 2 O SUB 3 powder target and patterned using photolithography. Scanning electron microscope (SEM) and Photoluminescence (PL) measurement findings indicate that reasonably high-quality single crystalline GaAs layers could be successfully grown selectively on the unmasked region by metal organic vapor phase epitaxy (MOVPE) and atomic layer epitaxy (ALE). The GaAs/AlGaAs quantum structure was also fabricated by selective area MOVPE, however, at this stage, polycrystalline AlGaAs layers formed on the mask region after the mask removal and the regrowth of AlGaAs overlayers. The key factor in this microstructure fabrication process is the sensitive dependence of Ga oxide layers against the reactor pressure under H SUB 2 exposure. (c) 1999 Publication Board, Japanese Journal of Applied Physics.

English Descriptors: Experimental study; Measuring methods; Semiconductor quantum wells; Gallium arsenides; Aluminium compounds; Oxygen compounds; VPE; Masks; Photoluminescence; Visible spectra

French Descriptors: 8115K; 6865; 7866F; Etude experimentale; Methode mesure; Puits quantique semiconducteur; Gallium arseniure; Aluminium compose; Oxygene compose; Epitaxie phase vapeur; Masque; Photoluminescence; Spectre visible

Classification Codes: 001B80A15K; 001B60H65; 001B70H66F

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2/9/48 (Item 4 from file: 144)

DIALOG(R) File 144:Pascal

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12983450 PASCAL No.: 97-0262219

Surface chemistry of In SUB 2 O SUB 3 deposition using In(CH SUB 3) SUB 3 and H SUB 2 O in a binary reaction sequence

Atomic layer epitaxy and related surfaces processes

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ALE-4. International Symposium, 4 (Linz AUT) 1996-07-20

Journal: Applied surface science, 1997, 112 205-215

ISSN: 0169-4332 CODEN: ASUSEE Availability: INIST-16002;

354000064628250320

No. of Refs.: 35 ref.

Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)

Country of Publication: Netherlands

Language: English

Sequential surface chemical reactions for the controlled deposition of In SUB 2 O SUB 3 were examined using transmission Fourier transform infrared (FTIR) spectroscopy. In this study, the binary reaction (2In(CH SUB 3) SUB 3 + 3H SUB 2 O rightarrow In SUB 2 O SUB 3 + 6CH SUB 4) was separated into two half-reactions: (A) InOH* + In(CH SUB 3) SUB 3 rightarrow In-O-In(CH SUB 3) SUB 2 * + CH SUB 4 ; (B) InCH SUB 3 * + H SUB 2 O rightarrow InOH*

+ CH SUB 4 , where the asterisks designate the surface species. The InOH and InCH SUB 3 * surface species were monitored by the infrared absorbances of the InO-H and InC-H SUB 3 stretching vibrations. The reactions were thermally activated and the maximum reaction temperature was limited to 525 K because of trimethylindium (TMIn) pyrolysis. At 525 K, the (A) reaction saturated after depletion of similar 60% of the InOH* coverage. In contrast, the (B) reaction went to completion and was self-limiting. Despite these observed surface reactions, the growth of conformal In SUB 2 O SUB 3 films was not achieved on Si(100) at 525 K. Very rough In SUB 2 O SUB 3 films with low growth rates were also observed at 675-775 K in previous studies using InCl SUB 3 and H SUB 2 O in a binary reaction sequence. The thermal stabilities of the InOH* and InCH SUB 3 * surface species were measured from 300-900 K. The low coverage of surface species at the various reaction temperatures may explain the rough In SUB 2 O SUB 3 films and low In SUB 2 O SUB 3 growth rates.

English Descriptors: Experimental study; Infrared spectrum; Surface reaction ; Gas solid interface; Indium oxide

Broad Descriptors: Inorganic compound; Compose mineral; Compuesto inorganico

French Descriptors: Etude experimentale; Spectre IR; Reaction surface; Interface gaz solide; Indium oxyde; In2O3; In O

Classification Codes: 001C01I04

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2/9/49 (Item 5 from file: 144)
DIALOG(R) File 144:Pascal
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12895014 PASCAL No.: 97-0160257

Role of Kupffer cell-derived reactive oxygen intermediates in alcoholic liver disease in rats in vivo

TAKEYAMA Y; KAMIMURA S; KUROIWA A; SOHDA T; IRIE M; SHIJO H; OKUMURA M
ISHII Hiromasa, ed

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Department of Internal Medicine, School of Medicine, Keio University, Tokyo, Japan

Japanese Society for Biomedical Research on Alcoholism, Japan.

Annual Conference of the Japanese Society for Biomedical Research on Alcohol (JASBRA), 16 (JPN) 1996-02

Journal: Alcoholism, clinical and experimental research, 1996, 20 (9 SUP) 335A-339A

ISSN: 0145-6008 CODEN: ACRSDM Availability: INIST-17114;
354000061427080120

No. of Refs.: 43 ref.

Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)

Country of Publication: United States

Language: English

The pathophysiology of alcoholic liver disease (ALD) remains largely unknown. In this work, we have developed an experimental rat model to elucidate the mechanism of liver injury, including ALD, in which Kupffer cell-derived reactive oxygen intermediates (ROIs) might be involved. Groups of male Wistar rats were pair-fed on a liquid high-fat diet containing ethanol (36% of total calories) or isocaloric carbohydrate with or without dietary carbonyl Iron (0.5% w/v) for 3 weeks. In this rat model, we investigated Kupffer cell-derived ROI generation, which affected hepatocellular injury and hepatic fibrosis in ALD. The production of ROIs in Kupffer cells isolated from the iron-fed, the ethanol-fed, and the ethanol plus iron-fed rats were significantly increased, compared with that in Kupffer cells isolated from control rats (iron > ethanol + iron > ethanol control). However, hepatic vitamin E content in the ethanol plus iron-fed

rats was decreased rather than that in the iron-fe ts. Then, lipid peroxidation of isolated microsomes was assessed as malondialdehyde equivalents determined by thiobarbituric acid assay. Compared with controls, the malondialdehyde equivalents were elevated in experimental groups (ethanol + iron > ethanol > iron > control). Serum ALT levels were greatly elevated in rats fed a diet containing both ethanol and iron (ethanol + iron > iron > ethanol > control). Hepatic content of hydroxyproline was significantly increased in ethanol plus iron-fed rats, compared with rats other than the ethanol plus iron-fed group (ethanol + iron > iron > ethanol > control). These results suggested that the enhanced Kupffer cell-derived ROI generation could itself contribute to the increased susceptibility to lipid peroxidation, which might cause hepatocellular injury and lead to hepatic fibrosis in **ALD**.

English Descriptors: Alcoholism; Hepatic disease; Mechanism of action; Etiopathogenesis; Rat; Animal; Kupffer cell; Free radical; Oxidative stress; Peroxidation; Lipids; Fibrosis
Broad Descriptors: Digestive diseases; Rodentia; Mammalia; Vertebrata; Appareil digestif pathologie; Rodentia; Mammalia; Vertebrata; Aparato digestivo patologia; Rodentia; Mammalia; Vertebrata

French Descriptors: Alcoolisme; Foie pathologie; Mecanisme action; Etiopathogenie; Rat; Animal; Cellule Kupffer; Radical libre; Stress oxydatif; Peroxydation; Lipide; Fibrose; Oxygene actif

Classification Codes: 002B03F

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2/9/50 (Item 6 from file: 144)
DIALOG(R) File 144:Pascal
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12296075 PASCAL No.: 95-0529270

Comparison between CVD and ALE produced TiO SUB 2 cathodes in Zn/(PEO) SUB 4 Zn SUB 2 Cl SUB 2 /TiO SUB 2 ,SnO SUB 2 or ITO galvanic cells
TURKOVIC A; DRASNER A; SOKCEVIC D; RITALA M; ASIKAINEN T; LESKELAE M
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EUROCVI 10 : European conference on chemical vapour deposition, 10 (Venice ITA) 1995-09-10

Journal: Journal de physique. IV, 1995, 5 (5 p.2) C5.1133-C5.1139

ISSN: 1155-4339 Availability: INIST-125C; 354000053715630660

No. of Refs.: 16 ref.

Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)

Country of Publication: France

Language: English

The way of preparation of thin films of TiO SUB 2 is extremely important regarding its application in electronic and optoelectronic devices. We have assembled Zn/(PEO) SUB 4 ZnCl SUB 2 /TiO SUB 2 ,SnO SUB 2 or ITO rechargeable galvanic cells using CVD (chemical vapour deposition) or **ALE** (**atomic layer epitaxy**) produced TiO SUB 2 cathodes. The charge-discharge cycles were measured with a constant current in the range of 10 SUP - SUP 6 to 10 SUP - SUP 5 A for different cells. It was shown that CVD prepared TiO SUB 2 cathode is increasing capacity of the cell by allowing higher constant currents to be applied to the cell. The complex impedance measurements of the electrolyte (PEO) SUB 4 ZnCl SUB 2 have been performed in the range of 1 Hz to 1 MHz and in the temperature range from 290 to 400 K by applying Zn or Sn electrodes.

English Descriptors: Polymer solid electrolyte; Electrical characteristic; Comparative study; Epitaxy; Atomic layer method; Secondary cell; Battery; Zinc; Production process; Intercalation compound; Reversible **reaction** ; Discharge charge cycle; Cathode; Titanium **oxide** ; Thin film; Chemical